

**Alternatives Selection Report  
State Route (SR) 801  
SR 303L to SR 202L**

ADOT Project No. 801 MA 000 H6876 01L  
Federal Aid No. NH-801-B(ARG)  
Maricopa County, Arizona  
Central Construction District

**Prepared for:  
Arizona Department of Transportation  
Project Management**

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## Executive Summary

This *Alternatives Selection Report* (ASR) describes the development and evaluation process and the recommendations made for the proposed State Route (SR) 801 routes between the future Loop 303 (SR 303L) on the west to the future Loop 202 (SR 202L, South Mountain Freeway) on the east in western Maricopa County, Arizona. This document is the precursor to the Location/Design Concept Report (L/DCR) and the Draft Environmental Assessment (EA). The L/DCR and the Draft EA will carry the findings of this document to the next level of analysis. The ASR's intent is to document the screening process for the alternatives that do not warrant further analysis. The Arizona Department of Transportation (ADOT), with concurrence from the Federal Highway Administration (FHWA), makes the decisions as to which alternatives warrant further analysis.

The ADOT project number for this study is 801 MA 000 H6876 01L and the federal aid number is NH-801-B(ARG).

In November of 2004, the voters of Maricopa County approved Proposition 400. The passage of Proposition 400 allowed for a 20-year extension of a ½-cent sales tax to continue to improve the existing regional transportation system and construct new freeways in Maricopa County. This plan is administered by the Maricopa Association of Governments (MAG) and is called the Regional Transportation Plan (RTP). SR 801 is one of the new freeways designated in the RTP.

The Regional Public Transportation Authority (RPTA), MAG, and ADOT have worked together to develop the RTP. The recommended improvements are consistent with regional freeway, High Occupancy Vehicle (HOV), and transit system studies. Funding for advance right-of-way purchasing is available for the proposed SR 801 freeway in Phases I and II (2005–2010 and 2011–2015) of the RTP. However, funding for the design and construction of SR 801 as shown in this report would not be available until Phases III and IV (2016–2020 and 2021–2026) of the RTP.

The purpose of this new facility is to ease traffic congestion and provide a supplemental transportation link for Interstate 10 (I-10) in western Maricopa County by increasing the east-west freeway capacity in the region. The project would support the plans, policies, and growth objectives of jurisdictions in the region, including the Town of Buckeye, City of Goodyear, City of Avondale, City of Phoenix, and Maricopa County. In addition, the project would support the plans for other regional facilities, such as the planned flood control infrastructure and expansion plans for the Phoenix-Goodyear Airport.

This project is needed to serve the population growth, economic development, and employment patterns that have resulted in increased traffic congestion on the existing regional freeway system and arterial streets. Additionally, 2030 peak-hour travel demands are projected to exceed the capacity of a built-out I-10 facility, resulting in the need for a reliever roadway for I-10. Lastly, no high-capacity transportation facility exists, other than I-10, in this part of Maricopa County. As a result, when I-10 must be closed to clear an incident (as it occasionally has in the past), traffic backups can occur for many miles and can last hours resulting in lost time and impacts to air quality.

This proposed new facility would be roughly parallel to and approximately 5 miles south of I-10. The project is located in ADOT's Phoenix District within Maricopa County in south-central Arizona. This segment of the proposed SR 801 would begin at its western terminus with the system interchange between the future SR 303L and SR 801. From this point, SR 801 would travel in an easterly direction for approximately 14 miles before reaching its eastern terminus at a system interchange with the future SR 202L. At the time of this document's preparation, ADOT had selected the W55 alignment option as the preliminary preferred alignment for the SR 202L route in this area. All SR 801 options evaluated in this report assume this SR 202L alignment would be selected as the final alignment. If this assumption turns out to be incorrect, the findings of this report will be reevaluated.

The proposed roadway typical section would accommodate a barrier divided, ten-lane section with 12-foot-wide travel lanes, a four-foot HOV buffer, and 12-foot-wide shoulders. Entrance and exit ramps would be designed using a parallel-type configuration coupled with auxiliary lanes between traffic interchanges (TIs) less than one mile apart. This entire section would be paved with Portland Cement Concrete Pavement (PCCP) and overlaid with Asphalt Rubber Friction Course (ARFC).

The RTP has programmed funds to construct the outermost six lanes (three in each direction), auxiliary lanes, and the outside shoulder of the ultimate typical section. An interim 8-foot wide asphaltic concrete inside shoulder would also be included. The interim median would be an 74-foot-wide open-graded median with cable barriers.

The proposed roadway typical section would accommodate a future (unfunded) median widening project that would fill in the 74-foot-wide open median with one additional general-purpose lane and one HOV lane in each direction. The HOV lane would be separated from the general-purpose lanes by a 4-foot-wide painted buffer section. A concrete median barrier would separate the directions of travel.

Generally, service TIs would be provided at section line roads to maintain the continuity of the local arterial street networks. However, each arterial crossroad would be evaluated on a case-by-case basis to determine the need for an interchange at that particular location. Diamond interchanges would be initially developed for this project because they generally represent the most common type of interchange used in the Phoenix area.

The freeway mainline would mostly feature an "at-grade" profile with the freeway crossing over the crossroads. Because of the elevated profile at the crossroads, overhead power line relocations may be required at some locations.

Off-site drainage would be collected and conveyed by a channel located on the north side of the freeway alignment. Detention basins would be integrated into the drainage channel design. Drainage outfalls to the Gila and Agua Fria rivers would be coordinated with the Flood Control District of Maricopa County to be consistent with the district's watercourse master plans and area drainage master plans.

The SR 801 Study Area contains many noteworthy utility facilities including:

- facilities belonging to four major power companies, including several high voltage overhead transmission power lines ranging in size from 69 kV to 500 kV
- two electrical substations
- three wastewater treatment plants (WWTP) including the City of Phoenix's 91st Avenue Wastewater Treatment Plant, the Avondale Wastewater Treatment Plant, and the Goodyear Wastewater Treatment Plant
- a large diameter pipeline beginning at the 91st Avenue WWTP and ending at the Palo Verde Nuclear Generating Station (PVNGS) that supplies the plant's sole source of cooling water

Three other ongoing transportation studies will directly affect the SR 801 study. These studies include:

- SR 202L South Mountain Corridor Study Project (ADOT)  
<http://www.dot.state.az.us/Roads/SouthMtn/index.htm>
- SR 303L; South of I-10 Project (ADOT)  
[http://www.dot.state.az.us/Highways/valley\\_freeways/Loop\\_303/South/index.asp](http://www.dot.state.az.us/Highways/valley_freeways/Loop_303/South/index.asp)
- Interstate 10 – Hassayampa Valley Roadway Framework Study (MAG)  
<http://www.mag.maricopa.gov/project.cms?item=6125>
- Avenida Rio Salado Project (City of Phoenix)

The SR 801 Study Team (primarily made up of ADOT, the FHWA and HDR staff members) has been in regular communication with representatives for these other projects to monitor progress and to incorporate decisions into the SR 801 project as necessary.

Additional reports were prepared as part of this study. Many are considered “pre-decisional” and are not available for release. The first three are not pre-decisional and are available, with the first two appearing in the appendix of this document. These reports include:

- *Roadway Design Criteria Report* (June 2006)
- *Groundwater Survey & Assessment Report* (May 2007)
- *Initial Traffic Report* (May 2006)
- *Draft Noise Report* (December 2006)
- *Draft Air Quality Report* (December 2006)
- *Draft Preliminary Initial Site Assessment* (December 2006)
- *Draft Section 4(f) and Section 6(f) Report* (February 2007)
- *Draft Water Resources Report* (November 2006)
- *Draft Prime and Unique Farmland Report* (November 2006)
- *Draft Purpose and Need Report* (December 2006)
- *Draft Cumulative and Indirect Impacts Report* (February 2007)
- *Draft Jurisdictional Waters Report* (December 2006)
- *Draft Floodplain Report* (December 2006)
- *Draft Socioeconomic Report* (February 2007)
- *Draft Transit Modal Analysis* (November 2006)
- *A Class III Cultural Resource Survey of Proposed Alignments for the SR 801 Freeway, SR 303L to SR 202L, Maricopa County, Arizona* (December 2006)
- *Public Information Meetings Draft Comment Summary Report* (December 2005)
- *Draft Agency and Public Scoping Report* (August 2006)

This report contains the following appendices:

- Appendix A – Plans and typical sections of subsections
- Appendix B – Timeline of events
- Appendix C – *Design Criteria Report*
- Appendix D – *Groundwater Survey & Assessment Report* (text portion only)
- Appendix E – Construction cost estimates for subsections
- Appendix F – SR 801/SR 303L interchange concepts study

This report developed and evaluated eleven subsections within the Study Area defined in Chapter 1. These eleven subsections were evaluated based on 33 criteria falling into broad categories: cost, community support, engineering issues, and environmental issues. Chapter 2 explores many of these criteria in detail while Chapter 3 summarizes the evaluation results.

This report recommended that four of the eleven subsections be carried forward into the L/DCR document. These four subsections were 1b, 2a-2, 2c-3, and 3b. When combined, these four subsections make up two

complete build alternatives for the project corridor. These two alternatives are illustrated and discussed in Chapter 4.

- 1b, 2a-2, 3b = North Alternative
- 1b, 2c-3, 3b = South Alternative

The Study Team concluded that the North Alternative has several advantageous features—including a cheaper cost of construction and right-of-way and superior engineering and environmental traits—when compared with the South Alternative. However, the North Alternative lacks support from local governments, primarily because of the impacts to planned development. By contrast, the South Alternative is more expensive and has less desirable engineering and environmental constraints, but has the full support of the local governments. As a result, ADOT and the FHWA agreed with the Study Team’s conclusions and recommended that the two alternatives be carried forward to the next level of analysis before a single recommended alternative is selected.

New right-of-way would be required for this facility. Table ES.1 shows the right-of-way needs for each of the two alternatives. The RTP has right-of-way funded in Fiscal Years 2008 through 2015 and 2020 through 2022.

**Table ES.1 – Right-of-Way Requirements and Costs**

Alternative	Acres	Cost *
North	1800	\$267,000,000
South	1719	\$277,000,000

\* Right-of-way costs shown are acquisition costs only and do not include relocation, demolition, or sand and gravel operation impact costs. Costs are based on current land use and 2006 dollars.

Construction costs were estimated for all of the alternatives developed. These costs reflect the construction of the six-lane freeway with the 74-foot wide median. Details of this analysis are found in Chapter 2 and Appendix E. The total estimate of construction costs for each of the two alternatives being carried forward is summarized in Table ES.2. The RTP has construction funded in Fiscal Years 2023 through 2025.

**Table ES.2 – Estimated Construction Costs (2006 dollars)**

Alternative	Cost
North	\$1,068,450,000
South	\$1,153,025,000

The next step in the study process is to carry the two build alternatives and the no-build alternative into the L/DCR to determine a single recommended alternative. The Study Team anticipates that the L/DCR will be complete in mid-2008.

## 1.0 Introduction

### 1.1 Project Description

This *Alternatives Selection Report* (ASR) describes the development and evaluation process and the recommendations made for the proposed State Route (SR) 801 routes between the future Loop 303 (SR 303L) on the west to the future Loop 202 (SR 202L, South Mountain Freeway) on the east in western Maricopa County, Arizona. This document is the precursor to the Location/Design Concept Report (L/DCR). The L/DCR will carry the recommendations of this document to the next level of analysis. The ASR's intent is to document the screening process for the alternatives that do not warrant further analysis. The Arizona Department of Transportation (ADOT), with concurrence from the Federal Highway Administration (FHWA), makes the decisions as to which alternatives warrant further analysis.

This proposed new facility would be roughly parallel to and approximately 5 miles south of Interstate 10, (I-10, Papago Freeway). The project is located in the ADOT Phoenix District within Maricopa County in south-central Arizona. Project location and project vicinity maps are displayed in Figures 1.1 and 1.2, respectively.

This segment of the proposed SR 801 would begin at its western terminus with the system traffic interchange between the future SR 303L and the proposed SR 801. From this point, SR 801 would travel in an easterly direction for approximately 14 miles before reaching its eastern terminus at a system traffic interchange with the future SR 202L. At the time of this document's preparation, ADOT had selected the W55 alignment option as the preliminary preferred alignment for the SR 202L route in this area. All SR 801 options evaluated assume this SR 202L alignment would be selected as the final alignment. If this assumption turns out to be incorrect, the findings of this report will be reevaluated.

The proposed roadway typical section would accommodate a barrier divided, ten-lane section with 12-foot-wide travel lanes, a four-foot HOV buffer, and 12-foot-wide shoulders. Entrance and exit ramps would be designed using a parallel-type configuration coupled with auxiliary lanes between traffic interchanges (TIs) less than one mile apart. This entire section would be paved with Portland Cement Concrete Pavement (PCCP) and overlaid with Asphalt Rubber Friction Course (ARFC).

The RTP has programmed funds to construct the outermost six lanes (three in each direction), auxiliary lanes, and the outside shoulder of the ultimate typical section. An interim 8-foot wide asphaltic concrete inside shoulder would also be included. The interim median would be an 74-foot-wide open-graded median with cable barriers.

The proposed roadway typical section would accommodate a future (unfunded) median widening project that would fill in the 74-foot-wide open median with one additional general-purpose lane and one HOV lane in each direction. The HOV lane would be separated from the general-purpose lanes by a 4-foot-wide painted buffer section. A concrete median barrier would separate the directions of travel.

Detailed typical sections can be viewed in Appendix A, accompanying the plan and profile sheets.

Generally, TIs would be provided at section line roads so that the local arterial street network would maintain its continuity. However, each arterial cross street would be evaluated on a case-by-case basis to determine the need for a TI at that particular location. Diamond interchanges, as depicted in the ADOT *Roadway Design Guide* (RDG) Figure 502.1, would initially be developed on this project because they generally represent the most common type of interchange used in the Phoenix area.

The freeway mainline would mostly feature an "at-grade" profile with the freeway crossing over the crossroads. Because of the elevated profile at the crossroads, overhead power line relocations may be required at some locations.

Off-site drainage would be collected and conveyed by a channel located on the north side of the freeway alignment. Detention basins would be integrated into the drainage channel design.

### 1.2 Background

In November of 2004, the voters of Maricopa County approved Proposition 400. The passage of Proposition 400 allowed for a 20-year extension of a ½-cent sales tax to continue to improve the existing regional transportation system and to construct new freeways in Maricopa County. This plan is administered by the Maricopa Association of Governments (MAG) and is called the Regional Transportation Plan (RTP). SR 801 is one of the new freeways designated in the RTP.

The Regional Public Transportation Authority (RPTA), MAG, and ADOT have worked together to develop the RTP. The recommended improvements are consistent with regional freeway, HOV, and transit system studies. Funding for advance right-of-way purchasing is available for the proposed SR 801 freeway in Phases I and II (2005–2010 and 2011–2015) of the RTP. However, funding for the design and construction of SR 801 as shown in this report would not be available until Phases III and IV (2016–2020 and 2021–2026) of the RTP.

The purpose of this new facility is to ease traffic congestion and provide a supplemental transportation link for the existing I-10 facility in western Maricopa County. The proposed SR 801 would increase the east-west freeway capacity in the region. The project would support the plans, policies, and growth objectives of municipalities in the region. Coordination with these jurisdictions has occurred over the course of this study.

This project is needed to serve the anticipated population growth, economic development, and employment patterns that have and will continue to produce increased traffic congestion on the existing regional freeway system and arterial streets. Additionally, 2030 peak-hour travel demand is projected to exceed the capacity of a built-out I-10 facility, resulting in the need for a reliever roadway for I-10. Lastly, no high-capacity transportation facility exists, other than I-10, in this part of Maricopa County. As a result, when I-10 must be closed to clear an incident (as it occasionally has in the past), traffic backups can occur for many miles and can last hours resulting in lost time and impacts to air quality.

A listing of key events, meetings, and decisions that have occurred during the development of the SR 801 study is presented in Appendix B. Readers may find it useful to refer back to this timeline while reading this report to understand the sequence of events that occurred and how and when decisions were made.

### 1.3 Existing Conditions

The SR 801 Study Area encompasses approximately 22,300 acres and is located in southwest Maricopa County. The Study Area crosses the cities of Goodyear, Avondale, and Phoenix; and unincorporated Maricopa County. The existing land use is predominantly agricultural, which includes dairy operations. Specific land uses were identified by site characteristics through aerial imagery, field verification, and zoning data. Undeveloped land represents vacant parcels that are scattered throughout the Study Area. Many of the larger vacant parcels have residential subdivisions planned and/or platted. Table 1.1 summarizes the existing land use (in acres) of the Study Area by jurisdiction.

Figure 1.1 – Project Location Map

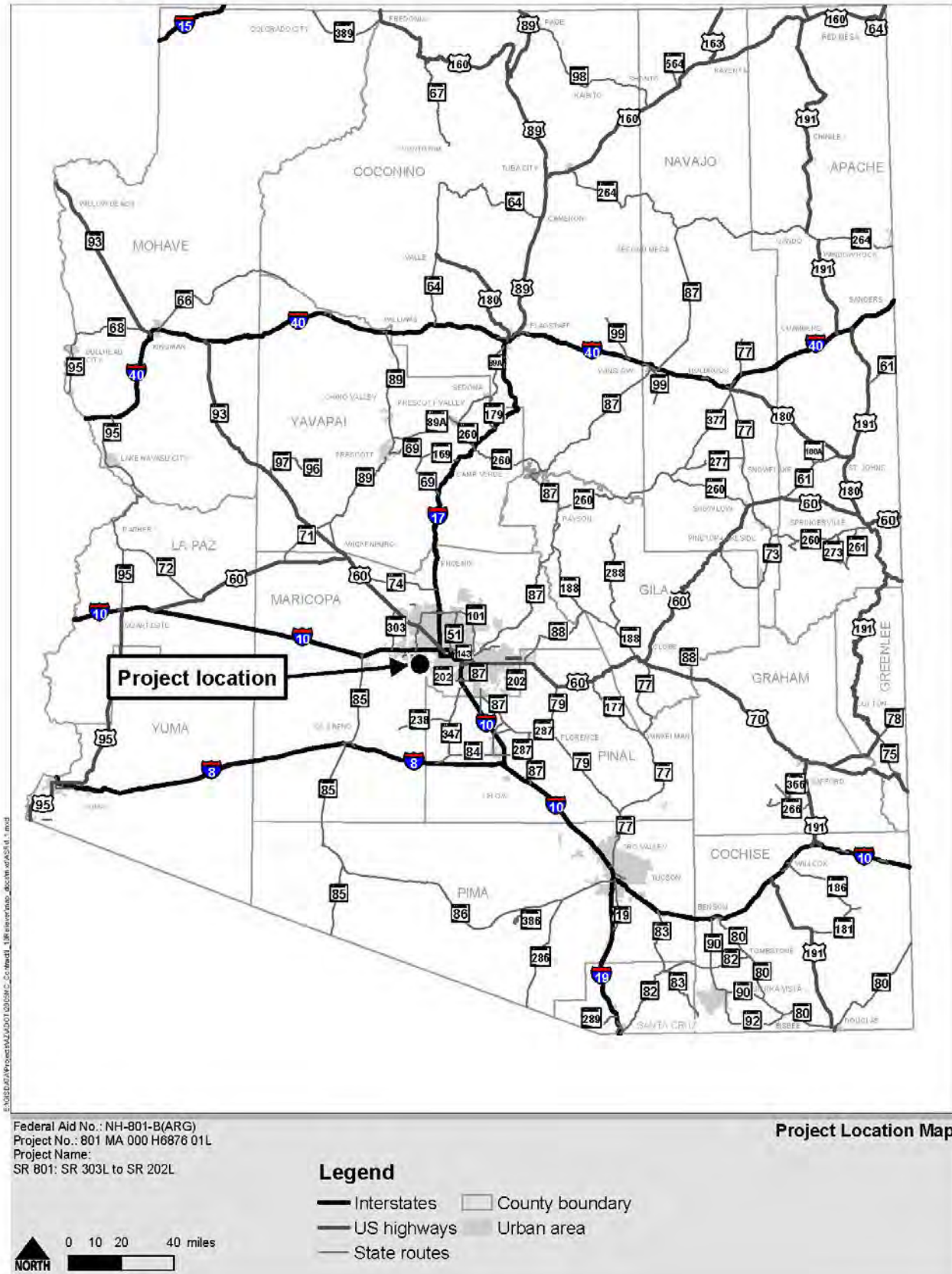
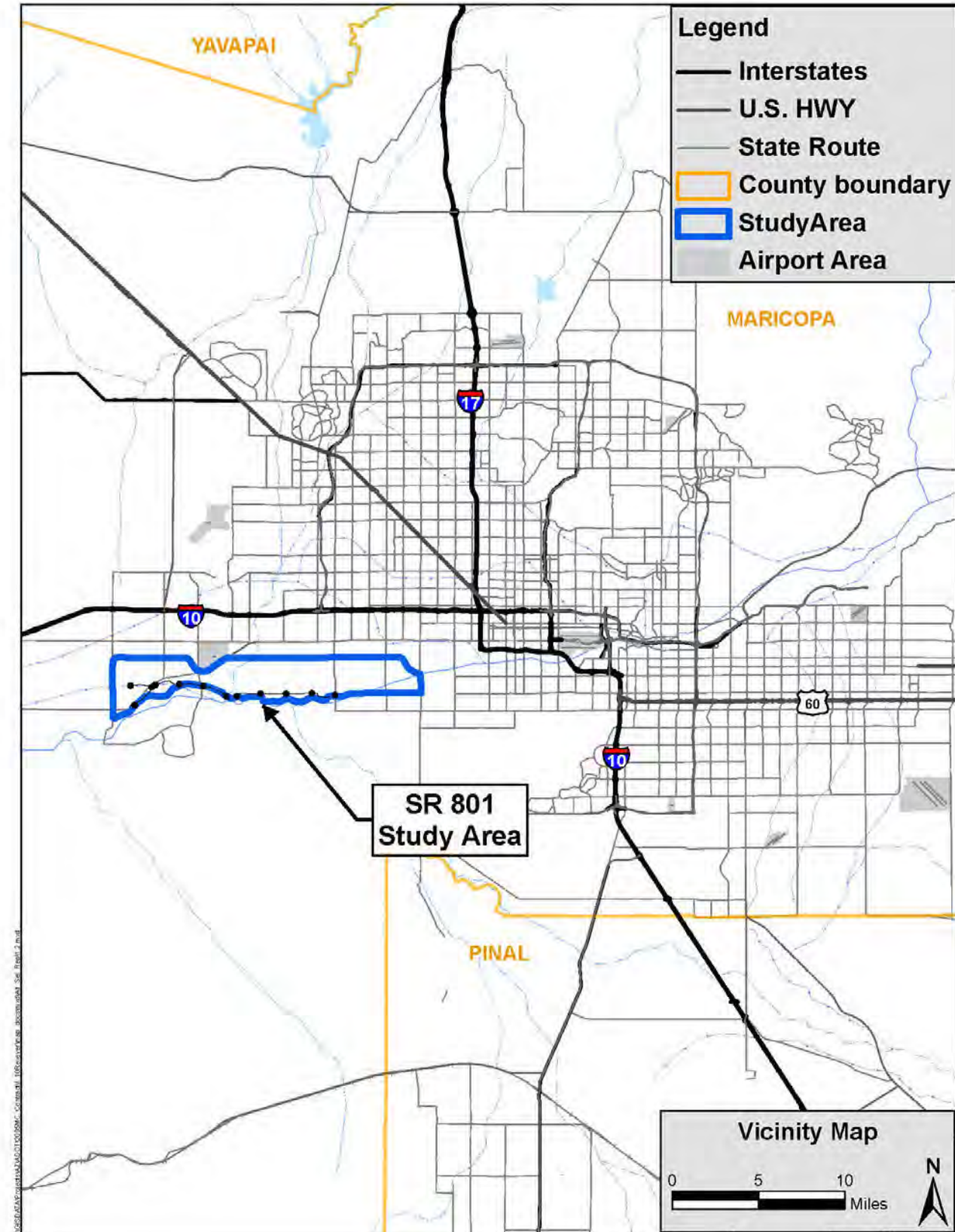


Figure 1.2 – Vicinity Map



**Table 1.1 – Existing Land Use (Acres)**

Land use	Avondale		Goodyear		Phoenix		Study Area	
	Acres	%	Acres	%	Acres	%	Acres	%
Residential	1,018	17	292	4	2,380	26	3,690	17
Commercial	6	<1	7	<1	38	<1	51	<1
Industrial	249	4	150	2	498	5	897	4
Agriculture	3,566	58	5,752	83	4,367	47	13,685	61
Undeveloped	487	8	507	7	521	6	1,515	7
Public	82	1	27	<1	571	6	680	3
Open space	10	<1	54	1	0	0	64	<1
Water	743	12	110	2	904	10	1,757	8
<b>Total:</b>	<b>6,161</b>	<b>100</b>	<b>6,899</b>	<b>100</b>	<b>9,279</b>	<b>100</b>	<b>22,339</b>	<b>100</b>

Several land uses encompassing large areas within the Study Area are worth noting:

- Three wastewater treatment plants (WWTPs) are within the Study Area, including the Avondale WWTP, the Goodyear WWTP, and Phoenix’s 91st Avenue WWTP. All three plants have expansion plans and the boundaries used for this study reflect the maximum growth boundary for each site.
- Associated with the 91st Avenue WWTP is the planned Tres Rios project adjacent to and within the Gila and Salt rivers. This project is described in more detail in Chapter 2.
- Numerous high-voltage overhead transmission power line corridors exist within the Study Area. Arizona Public Service (APS), Salt River Project (SRP), Tucson Electric Power (TEP), and the Western Area Power Administration (WAPA) own transmission facilities ranging from 69 kV to 500 kV.
- The Rudd Power Substation is located at El Mirage Road and Broadway Road.
- The Union Pacific Railroad (UPRR) cuts diagonally across the west end of the Study Area. Numerous sensitive utilities exist inside the UPRR right-of-way, including fiber optic lines and petroleum pipelines.
- The Phoenix-Goodyear Airport is located just north of the Study Area near Estrella Parkway.
- The Agua Fria River bisects the Study Area between Litchfield Road and Dysart Road.
- Several sand and gravel operations are located along the north bank of the Gila River and along both sides of the Agua Fria River.
- Several dairies operate along Broadway Road.
- The old Rubbermaid plant is located at the northwest corner of Maricopa County Route 85 (MC 85) and Cotton Lane.
- The Lakin Cattle Company owns a large tract of land in the central portion of the Study Area within Avondale. This property is currently being planned as a large, master planned community.
- The Phoenix International Raceway (PIR) is located just outside the Study Area on the south side of the Gila River at Avondale Boulevard (115th Avenue). While not technically in the Study Area, PIR is important because it draws a high volume of traffic through the Study Area during major events.

- North-south traffic on arterial streets throughout the Study Area is somewhat limited because few crossings exist at the Salt and Gila rivers, which make up the Study Area’s southern boundary. Currently, bridge crossings are located at 51st Avenue, Avondale Boulevard, Bullard Avenue, and Estrella Parkway; another crossing is under construction at Cotton Lane. Low-flow crossings exist at 67th Avenue, 91st Avenue, and El Mirage Road.
- East-west traffic on arterial streets throughout the Study Area is constrained by the Agua Fria River, the UPRR tracks, and the Phoenix-Goodyear Airport. Buckeye Road (MC 85) is the only bridge crossing over the Agua Fria River and Lower Buckeye Road is the only low-flow crossing.
- The Buckeye Water Conservation and Drainage District (BWCCD), SRP, and the St. Johns Irrigation District have irrigation facilities that cross the Study Area.
- Bullard Wash, a regional flood control facility, crosses the Study Area from north to south about ¼ mile east of Estrella Parkway.
- APS owns a 104-inch to 114-inch diameter reclaimed water pipeline that begins at the 91st Avenue WWTP and ends at the Palo Verde Nuclear Generating Station (PVNGS). This pipeline roughly follows the Roeser Road alignment from the WWTP until its intersection with the Buckeye Canal. At that point, the pipeline parallels the northern edge of the canal to the PVNGS.

#### 1.4 Build-Out Conditions

Future land use of the Study Area was determined by reviewing MAG’s future land use database and the general plans of the municipalities within the Study Area. The MAG database considers both the types and densities of developments that are anticipated to occur.

Table 1.2 summarizes the anticipated future land use (in acres) of the Study Area.

**Table 1.2 – Anticipated Future Land Use**

Land use	Approximate number of acres	Percentage of Study Area
Commercial	565	2.5
Industrial	3,437	15.4
Mixed use	0	0.0
Open space / Water	2,415	10.8
Public / Quasi-Public	983	4.4
Residential	14,939	66.9
<b>Total:</b>	<b>22,339</b>	<b>100.0</b>

A comparison of Tables 1.1 and 1.2 shows that a major change in land usage is anticipated in the Study Area. Approximately 67 percent of the future land use is projected to be residential, as opposed to 17 percent of the current land use. Perhaps the most notable change will occur in the agricultural land use category. Currently, approximately 61 percent of the Study Area consists of agricultural land. In the future, the agricultural component is expected to virtually disappear as the land is developed into other uses.

The Study Area contains 48 planned developments covering approximately 8,913 acres. These projects are in various stages of development, from planning to active construction.



It is anticipated that north-south traffic patterns on arterial streets throughout the Study Area would be enhanced over time by the local jurisdictions by replacing the existing low-flow river crossings at the Gila and Salt rivers with bridge crossings at 67th Avenue and El Mirage Road. A Salt River Bridge crossing at 91<sup>st</sup> Avenue could also occur, but would be dependent on the Gila River Indian Community. In addition, a new river crossing would ultimately be built at the Dysart Road crossing. It is also likely that existing bridge crossings would be widened to enhance capacity. Estrella Parkway would be an example of such a widening.

In addition, east-west traffic patterns on arterial streets throughout the Study Area would also be enhanced over time by the local jurisdictions by replacing the existing low-flow crossing of the Agua Fria River at Lower Buckeye Road with a bridge crossing. In addition, a new Agua Fria River crossing would be added on the Broadway Road alignment. It is also likely that the existing bridge crossing at Buckeye Road (MC 85) would be widened to enhance capacity. Also worth noting is Maricopa County's plans to transform MC 85 into an "intelligent" high capacity corridor. A recently completed corridor study for MC 85 by the Maricopa County Department of Transportation (MCDOT) documents this concept.

All of the WWTPs within the Study Area have expansion plans to keep up with growth in the area. These facilities are considered critical and unmovable. As a result, the SR 801 study collected the build-out expansion boundaries from the three WWTP owners and used these boundaries as fixed constraints for the development of SR 801 alternatives.

Two significant regional flood control facilities are planned within the Study Area. West of the Agua Fria River, the White Tanks/SR 303L Area Drainage Master Plan (ADMP) calls for an SR 303L outfall channel that runs north-south along the west edge of Cotton Lane, ultimately discharging into the Gila River. The location of this facility is being reevaluated at the time of this writing to coincide with the development of the SR 303L freeway study. East of the Agua Fria River, the Durango ADMP calls for the construction of the Durango Regional Conveyance Channel (DRCC) and includes two detention basins. Both of these planned facilities would have an impact on the SR 801 drainage system.

With the disappearance of agricultural lands from the Study Area over time, the existing irrigation delivery systems serving these lands would become obsolete. However, because of State of Arizona water rights laws, most of these systems would have to remain intact even though they may not serve a function in the future. In addition, some irrigation facilities may be considered historic and would, therefore, have to be preserved. This issue will need to be addressed in more detail and on a case-by-case basis as the proposed project moves forward to preliminary design.

Sand and gravel operations are currently located along the banks of the rivers within the Study Area. New facilities are planned in two areas. The first facility is located in the area surrounding the confluence of the Gila and Agua Fria rivers. The second facility is located in the area along the Salt River between 75th Avenue and 43rd Avenue. If affected, these businesses could represent considerable costs and technical challenges for the SR 801 freeway construction such as additional environmental mitigation / cleanup, drainage obstructions, 100-foot deep holes in the freeway path, and excessive settlement resulting from uncompacted backfills placed by the operators.

The Phoenix-Goodyear Airport has recently published a draft master plan document that calls for an expansion of the airport with a second parallel runway. These plans are not expected to affect the SR 801 project. UPRR is currently evaluating adding a second track within its railway corridor that crosses the Study Area. In addition, MAG is evaluating a commuter rail system that would use these tracks. These activities are not anticipated to have a material effect on the proposed SR 801.

## 1.5 Study Area and Corridors

### Study Area Description

Early in the study process, a Study Area was delineated to define the scope of the analysis. This Study Area, which was defined primarily through observation, is shown in Figure 1.3. Because the proposed SR 801 freeway was meant to parallel the existing I-10 facility, it was decided that the two facilities should be separated by at least 3 miles in order for SR 801 to effectively supplement I-10 operations and visa-versa. Consequently, the northern boundary of the Study Area was set at Lower Buckeye Road. The exception to this northern boundary occurs at the Phoenix-Goodyear Airport, where the northern boundary of the Study Area matches the southern limits of the airport in order to avoid affecting the airport.

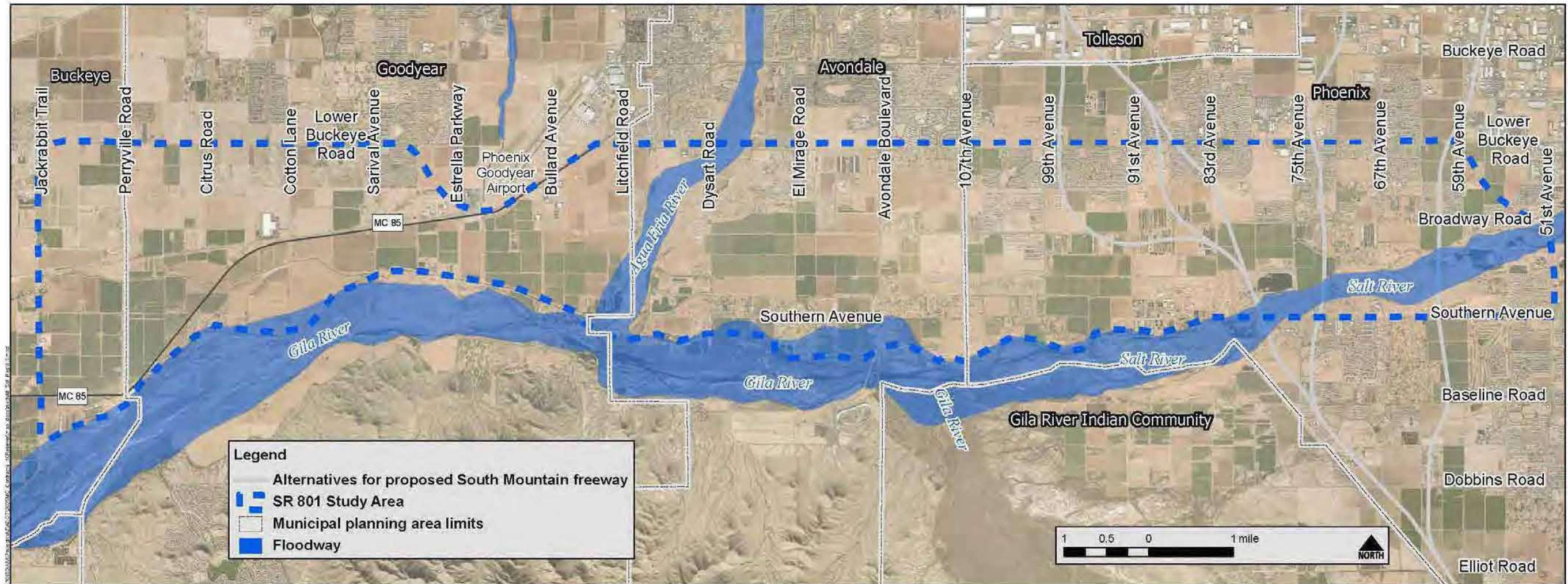
The southern boundary was defined as the northern banks of the Gila and Salt rivers, approximately 2 to 2.5 miles south of the northern boundary. The western boundary was set at the expected location of the SR 801/SR 303L system traffic interchange. When the Study Area was being defined, it was unclear where this interchange would occur, but it was known that SR 303L north of the Study Area would be built along the Cotton Lane alignment. Consequently, the western boundary was set at Perryville Road, which is 2 miles west of Cotton Lane, giving the project sufficient space to accommodate the SR 801/SR 303L interchange. The eastern boundary was to be located at the SR 801/SR 202L interchange. While the Study Area was being defined, five locations were being studied for SR 202L. Consequently, the eastern boundary was set as 51st Avenue to encompass the easternmost SR 202L alignment (W55).

### Study Corridor Description

Once the Study Area was defined and agreed to by ADOT, FHWA and the local jurisdictions, a baseline environmental analysis and major infrastructure search was conducted within this boundary. The findings were plotted on a map that illustrated major obstacles the freeway would have to avoid and/or overcome. Items included:

- Potential historical sites, features, and districts
- Hazardous material sites
- Known and potential Section 4(f) sites
- Areas with a higher percentage of low-income and higher percentage of minority populations
- Existing and planned Phoenix-Goodyear Airport protected airspace
- WWTP sites with future expansion boundaries
- Electrical substations
- Existing and planned major utilities, such as high voltage overhead power lines, large diameter or significant pipelines, and significant fiber optic facilities
- Existing and planned flood control features
- Significant existing quasi-public and private irrigation facilities
- Floodway and floodplain delineations for the Gila, Salt, and Agua Fria rivers

Figure 1.3 – Study Area Limits



Once these elements were mapped, 1,000-foot-wide corridors were developed to avoid or minimize the impacts to these features. These original 1,000-foot-wide corridors are shown in Figure 1.4. Later, these original corridors were expanded as the study evolved and additional constraints were discovered.

### 1.6 Section and Subsection Definition

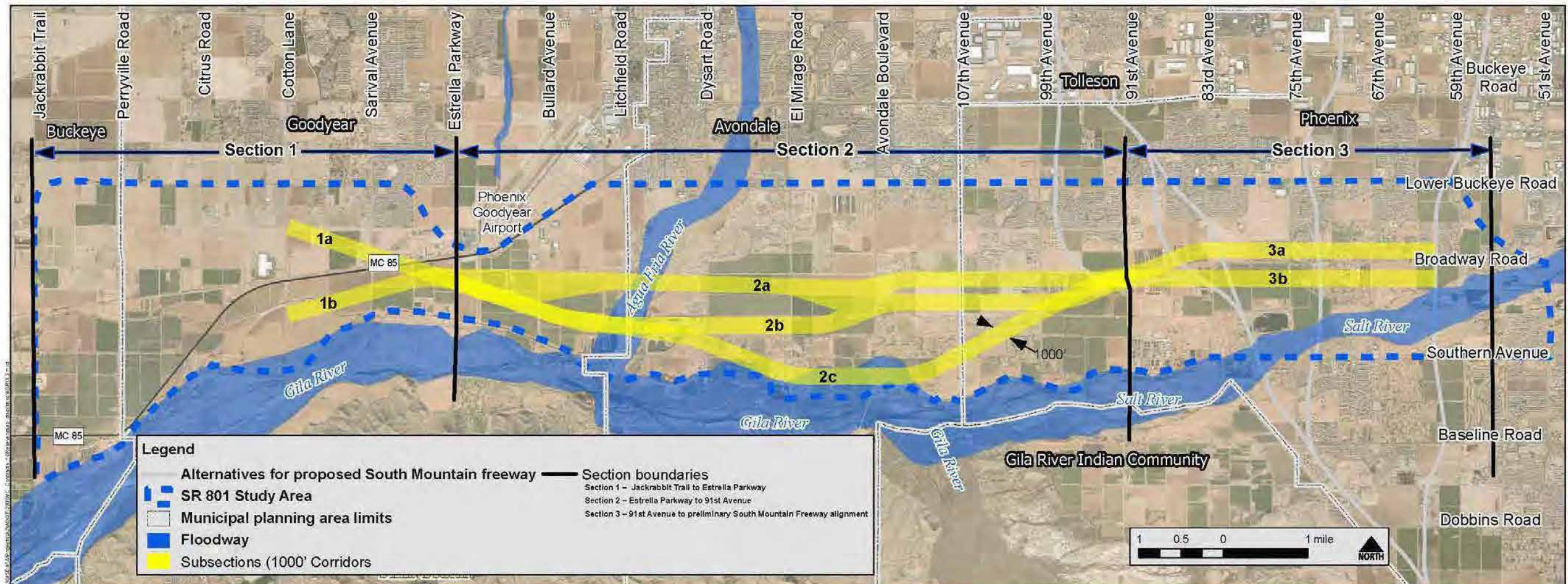
For evaluation purposes, the Study Area was divided into Sections 1, 2, and 3. Corridor subsections were developed within each section and included 1a, 1b, 2a, 2b, 2c, 3a, and 3b. It was quickly apparent that all proposed alignments considered for this Study Area would have to pass through two common “pinch points” located at approximately Estrella Parkway and 91st Avenue. Consequently, Section 1 consists of everything west of Estrella Parkway (including Subsections 1a and 1b), Section 2 consists of everything between Estrella Parkway and 91st Avenue (including Subsections 2a, 2b, and 2c), and Section 3 consists

of everything east of 91st Avenue (including Subsections 3a and 3b). Coincidentally, these three sections also loosely correspond to the three city jurisdictions within the Study Area (Section 1 = Goodyear, Section 2 = Avondale and Section 3 = Phoenix). The seven subsections uniquely identified the alternative 1,000-foot-wide corridors within the Study Area. The sections and subsections are also shown in Figure 1.4.

### 1.7 Community Outreach

To initiate the SR 801 study, the Study Area was presented to the participating agencies on September 26, 2005, at the ADOT Arizona Conference Room (1739 West Jackson Street, Phoenix, Arizona). Twenty-three agency staff members attended. Immediately following this meeting, two public informational meetings were held. The first occurred on September 27, 2005, at the Desert Edge High School Cafeteria

Figure 1.4 – Study Corridors and Section/Subsection Definition



(15771 West Yuma Road, Goodyear, Arizona) with 79 people in attendance. The second occurred on September 29, 2005, at the Union Elementary School Cafeteria (3834 South 91st Avenue, Tolleson, Arizona) with 81 people in attendance. These meetings informed agency representatives and members of the public about the project and gave them the opportunity to ask questions and provide early comments. A *Public Information Meetings Comment Summary Report* was prepared for these three meetings on December 19, 2005.

The next public outreach events occurred in March of 2006. One agency and two public scoping meetings were held. The agency scoping meeting was held on March 13, 2006, at the ADOT Human Resources Development Center (1130 North 22nd Avenue, Phoenix, Arizona). Thirty-six agency representatives signed in at that meeting. The first public scoping meeting was held on March 21, 2006, at the Union Elementary School (3834 South 91st Avenue, Tolleson, Arizona). One-hundred and twenty-nine individuals signed in at that meeting. The second public scoping meeting was held on March 23, 2006, at the Agua

Fria High School (530 East Riley Drive, Avondale, Arizona). One-hundred and fourteen individuals signed in at that meeting. At these three meetings, the Study Team presented three 1,000-foot-wide corridors developed within the Study Area. An agency and public scoping report was prepared for these three meetings in August of 2006.

In early November of 2006, the Study Team developed a project newsletter to mail to the residents and landowners within the Study Area. The newsletter updated the public on the progress made since the March 2006 public scoping meetings. The newsletter described the "expanded corridors" to the public and the reasons why the original 1,000-foot-wide corridors were expanded. The newsletter also informed the public that the SR 303L project team was having a public information meeting on November 30, 2006, and that representatives from the SR 801 Study Team would be available to answer questions pertaining to the newsletter.

On November 30, 2006, the SR 303L public information meeting was held at the Liberty Elementary School Multipurpose Room (19818 West Highway 85, Buckeye, Arizona). One-hundred and forty-six individuals signed in at that meeting. While the meeting was intended to provide information about the SR 303L project, a large percentage of the attendees also visited the SR 801 table and asked questions. A *Public Information Meeting Summary Report* was prepared in February of 2007 for the SR 303L meeting; however, the report does not specifically address the SR 801 project activities that occurred during the meeting.

In late April of 2007, a project flier advertising the next public information meeting scheduled for May 17, 2007, was developed and mailed to the residents and landowners within the Study Area. The flier updated the public on the progress made since the November 2006 newsletter. It illustrated the two build alternatives proposed to be carried forward into the L/DCR and Draft EA document and invited the recipients to the upcoming public meeting.

On May 17, 2007, the SR 801 public meeting was held at the Desert Edge High School Multipurpose Room (15778 West Yuma Road, Goodyear, Arizona). 113 individuals signed in at that meeting.

In addition to the meetings noted above, the Study Team made numerous presentations to the local jurisdictions' staff throughout the study process. These meetings are listed in Appendix B of this report.

## 2.0 Evaluation Criteria

### 2.1 Design Criteria

A separate *Roadway Design Criteria Report* was prepared for this project in June of 2006. That report is included in Appendix C. Some of the important design criteria are as follows:

**Design Speed:** The design speed for this facility would be consistent with the other segments of the MAG freeway system. Design speeds for different components of the proposed SR 801 system are as follows:

- Mainline freeway 65 mph (minimum)
- Entrance ramps 55 mph at mainline gore, 50 mph on main body of ramp, 35 mph at crossroad intersection
- Exit ramps 60 mph at mainline gore, 50 mph in main body of ramp, 35 mph at crossroad intersection
- Directional ramps 65 mph at mainline exit gore  
55 mph in main body of ramp  
55 mph at mainline entrance gore
- Collector-distributor 50 mph throughout
- Arterial roadways 50 mph

**Level of Service (LOS):** SR 801 would be designed for LOS C or D. LOS C is described as “stable operation” while LOS D describes the lower range of stable traffic flow.

**Design Year:** This project uses a design year of 2030. MAG projections of average daily traffic (ADT) through this corridor range up to 170,000 ADT. MAG does not currently offer traffic data projections beyond 2030. Because this project would be scheduled for construction between 2020 and 2025, the design year should be reassessed as this project progresses into the final design phase.

**Maximum Superelevation:** The maximum superelevation for this facility would be 6 percent.

**Design Vehicle:** A WB-67 vehicle would be used for the freeway, ramps and ramp intersections. A WB-50 would be used for the arterial facilities.

**Service Interchanges:** The assumed service interchange configuration was a standard diamond using approximately 650-feet of separation between ramp terminals. This interchange footprint is adequate to accommodate other types of configurations, such as single point urban interchanges, should traffic warrant.

**Interim and Ultimate Configurations:** For initial construction, the SR 801 is being designed as a 3+0 (three general-purpose and no HOV lanes) facility. Auxiliary lanes would be provided between successive on- and off-ramps. A 74-foot-wide open-graded median would accommodate one additional general-purpose lane and one HOV lane in each direction, ultimately making the facility a 4+1 configuration.

At the system traffic interchanges on either end of the project, provisions are being made to accommodate HOV directional ramps. A separate regional study is being prepared to determine which directions should be provided at each system interchange in the southwestern portion of the Phoenix area.

### 2.2 Right-of-Way

SR 801 is a proposed new freeway corridor. As such, no existing right-of-way exists for this facility. To estimate the cost of right-of-way for the proposed layouts, past land sale records were collected from the Maricopa County Assessor’s office. Sale records older than 2005 were not used in the evaluation. The

project corridor was divided into three sections for analysis. Section 1 ranged from the western boundary of the Study Area (approximately Perryville Road) to Estrella Parkway. Section 2 stretched from Estrella Parkway to 91st Avenue and Section 3 extended from 91st Avenue to the eastern boundary of the Study Area (approximately 51st Avenue). The analysis considered seven types of existing land uses for each section. The results of these sales comparisons are shown in Table 2.1. To determine the total right-of-way cost, each subsection footprint was compared against the assessor database in GIS. The resulting takes by existing land use types per subsection is summarized in Table 2.2.

**Table 2.1 – 2005-2006 Land Sale Comparisons within SR 801 Study Area (2006 dollars per acre)**

Existing Land use	Section 1	Section 2	Section 3	Corridor average	Value used
Agricultural	\$100,000	\$75,000	\$100,000	\$91,667	\$100,000
Commercial	\$250,000	\$225,000	\$325,000	\$266,667	\$275,000
Residential (medium density, four to six dwellings per acre)	\$1,850,000	\$2,200,000	\$2,100,000	\$2,050,000	\$2,100,000
Residential (low density, one dwelling per acre)	\$400,000	\$325,000	\$500,000	\$408,333	\$400,000
Vacant (large tracts)	\$100,000	\$125,000	\$75,000	\$100,000	\$100,000
Vacant (subdivided)	\$500,000	\$375,000	\$750,000	\$541,667	\$550,000
Unknown (estimated)	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000

**Table 2.2 – Land Takes by Existing Land Use (acres)**

Subsection	Agri-culture	Commercial	Medium density residential	Low density residential	Vacant (large tracts)	Vacant (subdivided)	Unknown	Total
1a	109	51	0	1	31	0	0	192
1b	230	35	0	1	0	0	60	326
2a-1	588	59	5	11	52	23	1	739
2a-2	681	64	5	9	87	33	1	880
2b-1	644	22	5	14	64	24	1	774
2b-2	561	14	5	9	79	24	1	693
2c-1	617	22	2	194	72	7	0	914
2c-2	517	29	7	197	77	22	0	849
2c-3	500	110	1	119	59	1	9	799
3a	209	47	58	41	7	21	40	423
3b	409	71	4	70	40	0	0	594

Multiplying the per acre prices from Table 2.1 by the corresponding takes in Table 2.2 resulted in the following estimated right-of-way land acquisition cost (Table 2.3):

**Table 2.3 – Right-of-Way Costs**

Subsection	R/W acquisition total
1a	\$28,425,000
1b	\$39,025,000
2a-1	\$107,875,000
2a-2	\$126,750,000
2b-1	\$106,250,000
2b-2	\$95,250,000
2c-1	\$160,600,000
2c-2	\$172,975,000
2c-3	\$137,300,000
3a	\$188,272,000
3b	\$100,825,000

**Table 2.4 – Earthwork Summary**

Subsection	Roadway excavation (cubic yards)	Drainage excavation (cubic yards)	Topsoil (cubic yards)	Borrow (cubic yards)
1a	635,000	255,000	345,000	1,500,000
1b	670,000	320,000	415,000	1,130,000
2a-1	2,170,000	1,640,000	1,120,000	2,145,000
2a-2	2,400,000	1,630,000	1,260,000	1,795,000
2b-1	2,240,000	1,165,000	1,120,000	2,040,000
2b-2	2,120,000	770,000	1,120,000	2,855,000
2c-1	2,015,000	1,195,000	1,115,000	3,250,000
2c-2	2,200,000	1,140,000	1,175,000	3,375,000
2c-3	2,045,000	995,000	1,220,000	3,590,000
3a	1,765,000	185,000	510,000	5,720,000
3b	1,520,000	270,000	440,000	5,295,000

The costs shown in Table 2.3 reflect only the cost of land and do not include other expenses resulting from demolition, relocations or other associated costs such as sand and gravel impact fees.

Control of access would be acquired along the proposed SR 801 right-of-way. At the service TIs, control of access would extend a minimum of 300 feet beyond the ramp terminal radius returns along the crossroads.

The RTP indicates that ADOT will have funding for SR 801 right-of-way preservation available beginning in fiscal year (FY) 2008. Current funding levels are as follows:

- FY 2008 through FY 2010: \$3,000,000 each year
- FY 2011 through FY 2012: \$5,000,000 each year
- FY 2013: \$10,000,000
- FY 2014: \$20,000,000
- FY 2015: \$20,000,000

### 2.3 Earthwork

All subsections were evaluated with rolling mainline profiles that generally cross over at-grade arterial streets and drop to near at-grade conditions around mid-mile locations. Depressed profiles were removed from consideration early on in the process primarily because of groundwater and utility issues. As a result, all of the subsections evaluated would require a substantial amount of borrow.

Each subsection was modeled to determine earthwork quantities. General assumptions used to compute the earthwork balance are as follows:

- 12% shrink factor
- 0.3 feet ground compaction factor
- 2 feet of topsoil plating
- 3 feet of overexcavation and recompaction under embankments

In addition, drainage channel and basin excavation quantities were estimated based on preliminary drainage design calculations. A summary of the earthwork quantities is presented in Table 2.4.

A specific borrow source has not been identified for the project. However, several regional flood control projects are currently planned within the Study Area and they could be potential material sources. If the current schedules for both SR 801 and the flood control projects remain unchanged, the flood control projects would be completed before the SR 801 freeway. Stockpiling of this material for ADOT future use may be a viable option. If this does not occur, other sources of borrow would be required.

### 2.4 Drainage

#### Existing Conditions

Stormwater runoff generally flows from northeast to southwest in the Study Area with the ultimate outfall being the Gila, Salt or Agua Fria rivers. The area is primarily agricultural and the fields have been laser leveled. Delivery and tailwater ditches provide irrigation water to the properties.

Existing drainage and flood control features have been identified through field visits, as-built plans, and drainage reports on file with the Maricopa County Flood Control District, City of Phoenix, City of Avondale and the City of Goodyear. They include:

- The Agua Fria River flows to the south through the Study Area and outfalls into the Gila River at approximately Litchfield Road.
- The Salt River bounds the Study Area on the south and flows to the west. It outfalls into the Gila River.
- The Gila River bounds the Study Area on the southwest and flows to the west.
- The Bullard Wash Outfall Channel lies between Estrella Parkway and Bullard Avenue. This wash has been channelized, is armored, and drains south to the Gila River from north of the Phoenix-Goodyear Airport.
- Floodplains exist along the Gila River, Salt River, Agua Fria River, and Bullard Wash Outfall Channel.
- The Tres Rios project, including the Tres Rios Levee, is located along the Salt River between 91st Avenue and the Agua Fria River confluence. This project is currently under construction.

Irrigation canals divide drainage areas into smaller areas. Consequently, it is important to identify their functions and locations. The following irrigation canals are located within the Study Area:

- The SRP Buckeye Feeder Canal runs through the Study Area between 55th Avenue and the Agua Fria River. This canal supplies irrigation water to properties in the area and conveys tailwater to the Gila River.
- The BWCDD canal flows from the Agua Fria River to Cotton Lane and continues west out of the SR 801 Study Area. This canal is a surface flow diversion and conveys groundwater and tailwater to the west.
- The St. Johns Irrigation District Canal flows between 55th Avenue and the Agua Fria River on the south side of Southern Avenue.
- Within the Study Area, several secondary irrigation supply and return flow ditches (lined and earthen) exist along the sides of many major roads.

Major storm drains, retention basins, and an effluent line exist in the Study Area and include:

- A City of Avondale large-diameter storm drain line exists in the northern portion of the Study Area between Dysart Road and Litchfield Road. This storm drain discharges to the Agua Fria River north of Broadway Road.
- An existing effluent line runs from the City of Phoenix 91st Avenue WWTP to the PVNGS. This pipe is generally located along Roeser Road and the BWCDD canal and has a limited maintenance outage schedule.
- The City of Phoenix is currently constructing a storm drain, varying in size from 66 to 96 inches, along 75th Avenue, which outlets into the Salt River. This storm drain is designed for 10-year flows and drains a basin at the corner of 75th Avenue and Van Buren Street. Additionally, street drainage east of 75th Avenue flows into this pipe by storm drain laterals sized for a 2-year storm.
- Scattered localized drainage basins have been constructed for the developed area's onsite storage requirements of a 100-year, 2-hour storm per the Maricopa County standard.

### Existing Studies and Models

Several existing studies have been performed in the project area. A list and description (where applicable) of each study is described below.

- *SR 303L Corridor/White Tanks Area Drainage Master Plan Update*, February 2005, by URS for the Flood Control District of Maricopa County (FCDMC). This ADMP studies the off-site flows from the White Tank Mountains east to the Agua Fria River and from US 60 south to the Gila River, with the inclusion of the proposed I-10/SR 303L system interchange. The report discusses both on- and off-site drainage for the realigned I-10 mainline through the system interchange. A HEC-1 model was created for the existing conditions and for the proposed drainage improvements. Conceptual design plans were created for proposed regional and roadway basins and channels along SR 303L and I-10.
- *Final Design Concept Report for SR 303L, I-10 to US 60*, December 2005, by URS for MCDOT. The DCR closely follows the concepts depicted in the ADMP for the SR 303L/White Tanks. The Final SR 303L DCR proposes an ultimate design for the realignment of I-10, which includes a normal crown typical section, curb and gutter, a complete roadway storm drain system, and a regional drainage system that follows the SR 303L alignment. The proposed regional drainage system continues to the south along the SR 303L alignment with an ultimate outfall at the Gila

River. This DCR is used as the basis for HDR's drainage design through the Study Area along Cotton Lane.

- *Durango Area Drainage Master Plan*, September 2005, by Dibble and Associates for the FCDMC. This ADMP determined conceptual designs to reduce flooding in the area between the Agua Fria River and 47th Avenue. Several channels, basins, and a storm drain were proposed. A HEC-1 model was created for the existing conditions, as well as one for the proposed drainage improvements.
- *Draft Candidate Assessment Report Durango Regional Conveyance Channel*, December 2005, by Aspen Consulting Engineers for the FCDMC. This report updated the drainage master plan described above and advanced the design of the DRCC and the Sunland Channel. The updated plan for DRCC removed the channel in Phoenix, relocated the 91st Avenue Basin to 99th Avenue and placed box culverts under 91st Avenue, 99th Avenue, and 107th Avenue to connect existing retention basins. The HEC-1 model was updated for the proposed drainage improvements. Conceptual design plans were created for proposed regional basins and channels.
- *Sun Valley Area Drainage Master Plan*, by J.E. Fuller for FCDMC. This ADMP is being developed to ensure responsible floodplain management and to coordinate flood control infrastructure improvements in conjunction with new development projects. The Sun Valley ADMP covers approximately 183 square miles, which includes the Town of Buckeye and portions of unincorporated Maricopa County.
- *Agua Fria Watercourse Master Plan*, November 2001, by Kimley-Horn and Associates for the FCDMC. The HEC-1 model for the Agua Fria River was obtained from the FCDMC. This model was originally prepared and adopted as part of the Agua Fria River Watercourse Master Plan by the FCDMC in 2001.
- *El Rio Watercourse Master Plan Overview Report*, March 2006, by Stantec Consulting, Inc. for the FCDMC. This study proposed levees and channel improvements for the Gila River from the Agua Fria River west to SR 85. With these planned improvements, portions of the SR 801 Study Area would be removed from the floodplain.

### Proposed Drainage Improvements by Others

Proposed drainage improvements have been identified within the Study Area. This information was collected through meetings and from plans and drainage reports on file with FCDMC, the City of Phoenix, the City of Goodyear, and the City of Avondale. The following drainage features are proposed within the Study Area:

- Durango Regional Conveyance Channel (FCDMC) – This proposed channel conveys flows generally from east to west between 107th Avenue and the Agua Fria River.
- Sunland Channel (FCDMC) – Flood control channel and box running east to west from 99th Avenue to Avondale Boulevard. This channel outlets into the DRCC.
- SR 303L Outfall Channel (MCDOT, FCDMC, ADOT) – This channel is associated with the future SR 303L freeway and is located just west of Cotton Lane and discussed in the SR 303L Corridor/White Tanks ADMP as well as the SR 303L Initial Design Concept Report.
- SR 202L South Mountain Freeway Drainage (ADOT) – Freeway drainage has been investigated for the future SR 202L. A channel and several basins are proposed for the new roadway.
- El Rio Watercourse Master Plan (FCDMC) – This study proposed levees and channel improvements for the Gila River from the Agua Fria River west to SR 85.

- Tres Rios (City of Phoenix and U.S. Army Corps of Engineers) – Levees and channel improvements along the Salt and Gila Rivers are proposed and under construction between 105th Avenue and the Agua Fria River.
- Localized drainage basins for developing areas to retain onsite storage requirements per the Maricopa County standard for the 100-year, 2-hour storm.

### Off-Site and On-Site Analysis Criteria

The drainage evaluation was based on the requirements of Chapter 600 of ADOT's RDG. Catch basin spacing was based on the allowable spread requirements for each roadway classification.

- For nondepressed roadways, the pavement drainage system shall be designed for a 10-year design storm frequency.
- For a 10-year storm frequency, allowable spread on all roadways shall not exceed the width of the roadway gutter, shoulder, and/or distress lane plus one-half of the adjacent lane on roadways with more than one lane in each direction.
- Allowable ponding depth on highways shall not exceed the height of the curb for a 10-year storm frequency.
- The capacity of detention basins and ditches that are parallel to the roadway and serve to convey roadway drainage shall be designed to meet the requirements of the 10-year storm frequency.
- For off-site drainage, a 50-year storm criteria shall be used. The RDG does allow for a higher storm event if local design criteria are more stringent, but any added cost associated with an event greater than the 50-year would have to be funded by the local agencies (ie: municipalities, flood control districts, etc.). Because the local agencies have shown interest in a 100-year event (consistent with the Tres Rios and local ADMPs), this report does apply the 100-year event since it defines a more conservative footprint for environmental clearance purposes. This analysis approach should not be interpreted as ADOT committing to fund a 100-year event.

### Off-Site Drainage Design Methodology

For each subsection, the existing ground topographic information was reviewed to determine the high points, low points, and longitudinal slopes of the existing terrain along the northern side of the proposed corridors. Off-site flow would be intercepted and conveyed along the north sides of the right-of-way in channels. Taking into consideration the utility crossings, major arterial street crossings, and other constraints, flow directions and outfall locations were determined.

With the drainage channel layouts determined, a flow analysis was performed for each subsection to quantify the flows. Consistent with the approach noted above, the hydrology data was based on the Durango ADMP (east of the Agua Fria River) and the White Tanks ADMP (west of the Agua Fria River). This is consistent with the Tres Rios project, which also used the Durango ADMP flows. The analysis evaluated both the existing condition and the future build-out condition. Additional analyses were required to include and exclude the numerous planned flood control projects (such as levees, regional drainage channels, etc.) that are not presently constructed. Next, two different design storm events (the 100-year, 6-hour storm and the 100-year, 24-hour storm) were analyzed for each of the possible build-out conditions. In total, eight different flow scenarios for each alternative were analyzed. In order to conceptually design an off-site drainage system, only the "worst-case" scenario, or the scenario that generated the most flow, was chosen because it would be the most conservative in terms of right-of-way needs and construction costs. An in-depth discussion of how this was completed is included in the following paragraph.

Each SR 801 alternative was overlaid onto the HEC-1 schematics that showed the subbasin layouts and flow routings for the existing and build-out drainage scenarios for the Durango ADMP and White Tanks ADMP. A series of Microsoft Excel spreadsheets was developed that estimated the flows that the various channels would see for each of the eight possible flow scenarios. This was accomplished by estimating the amount of flow that each channel would experience as a percentage of the subbasin hydrographs, routed flows, and concentration points from the appropriate HEC-1 model. The flows at each channel were based primarily on the local topographic information (contours and existing/proposed structures) and the HEC-1 flow routing schematics. This tended to be conservative because of time of concentration issues and flow routing. In order to compute more precise flows, new HEC-1 models would have to be generated for each of the various subsections. For the purposes of alternatives selection, this level of detail is unnecessary. However, new HEC-1 models will need to be developed in the preliminary design stage for the preferred build alternative.

After these "worst-case" flows were determined, HEC-RAS was used to aide in the channel design. Based on similar projects in the greater Phoenix area (SR 202L and I-10 as examples), as well as the economic impacts and feasible flow patterns, concrete-lined channels were chosen. This type of channel allowed a minimum longitudinal slope of 0.001 ft/ft and maximum side slopes of 2:1 (ft/ft). All the drainage channels were designed as trapezoidal channels with 2:1 side slopes and varying bottom widths and depths. Flowline elevations were computed by comparing the existing ground elevations and allowable channel slopes and maintaining 1 foot of freeboard above the calculated water surface. The top of the freeboard was set to the existing ground level to ensure that all surface flow would be able to gravity drain into the channel. For channels requiring a shallow flow depth, freeboard was maintained by widening the channel bottom. Channel widths were determined by inputting the "worst-case" flows into the HEC-RAS program and analyzing it with the channel geometry. An iterative process consisting of widening the channel bottom, altering the inverts and re-running the model was performed until an acceptable solution was found that held the freeboard criteria. Channel velocities, required cover at culvert crossings, and total channel depth were all major factors that drove the channel design.

In order to expedite the conceptual design process, the drainage channels were analyzed at the major arterial roads and routine points of interest (approximately three locations per mile). The channel cross sections were modeled in HEC-RAS with consistent widths for the full segment flow. This was done in lieu of tapering the width of the channels from upstream to downstream to better match the actual flow rates.

Culvert crossing calculations were completed using Culvert Master along with the "worst-case" flows. All of the culverts were conceptually designed as reinforced concrete box culverts (RCBC) with a 0.005 ft/ft longitudinal slope. The tailwater elevations were averaged to match the computed channel depths for the downstream channel, while the maximum allowable headwater was set to the top of the freeboard. The box sizes and numbers were determined for each significant crossing. To avoid depth and maintenance issues, all RCBC heights were limited to 4 to 6 feet.

The results of this conceptual off-site drainage design are shown in the subsection plans in Appendix A. It should be reiterated that ADOT only commits to constructing an off-site drainage facility sufficient for the 50-year event. By using the 100-year event for this analysis, a worst-case footprint was established so that no surprises would be encountered (engineering or environmental) in the future should the local agencies want to expand the capacity of the facility to accommodate a 100-year event.

### On-Site Drainage Design Methodology

An urban freeway section with curb and gutter was used for the on-site drainage analysis. The roadway cross section is proposed as normal crown geometry, except in areas of superelevation, allowing runoff to flow toward the outside. Catch basins and storm drain systems would be used to collect drainage flows.



In the interim, the median would be unpaved with a central median ditch with periodic catch basins to collect runoff and convey the flow to the north or south. The median would also convey the pavement runoff through superelevated curves. Ultimately, the median is planned to be paved. Consequently, the on-site drainage system was designed to accommodate these ultimate flows.

ADOT Standard C-15.91 and C-15.92, C-15.80 catch basins are assumed to intercept the flows along the mainline. Runoff collected in the catch basins would be conveyed in storm drains. First flush detention basins are proposed to collect on-site drainage prior to discharging. The basins are sized to accommodate and treat the first flush storm (5-year, 2-hour frequency storm) water quality. Collection of on-site stormwater has been determined by ADOT's Best Management Practices. Currently ADOT is revising its stormwater policy and the basin design would need to be revisited at the time of final design.

Storm events greater than the 5-year, 2-hour event would be routed to the offsite drainage channel along the north side of the roadway and would be conveyed to a discharge point. The ultimate outfall for the project is the Gila River or the Agua Fria River, depending on the alternative.

The proposed bridges over the Agua Fria River would have a high point near the center of the bridge and would drain both east and west. The deck drainage stormwater would flow toward the abutments and would be routed through first flush basins or other treatment facilities prior to discharge to the river.

Preliminary scour calculations have been performed on the proposed structure to assess their stability in the Agua Fria River environment. A scour value of 40 feet has been assumed for this analysis.

For the purposes of this alternatives selection, on-site drainage was not considered a major differentiator. As a result, the analysis focused on what a typical, on-site drainage system costs on a per-mile basis for an elevated and at-grade urban freeway. These costs were projected into the cost estimates and only varied based on the respective lengths of the alternatives being considered.

## 2.5 Groundwater

Early in the study, the Study Team recognized that shallow groundwater conditions would likely exist in the Study Area because of the proximity of the Gila, Salt, and Agua Fria rivers. This was confirmed by agency representatives, landowners, and utility company representatives familiar with the Study Area. As a result, a detailed *Groundwater Survey and Assessment Report* was prepared for the project. The text portion of this report is included in Appendix D.

This groundwater report documents the research and analysis that occurred in three parts: a historical groundwater depth analysis, a review of groundwater quality information near the Study Area, and a feasibility and cost study for dewatering a typical depressed traffic interchange within the Study Area. The report explains each of these elements in detail; they are summarized below.

### Historical Groundwater Depth Data

For groundwater depth information, the Study Team contacted the Arizona Department of Water Resources (ADWR) and acquired three CD's containing the following data sets:

- ADWR GIS data
- ADWR Wells 55 data (last updated in April 2005)
- ADWR Groundwater Site Inventory (GWSI) database (last updated in October 2004)

This data was sorted by township, range, and section and then sorted by individual wells within each section. Some well data were old and/or inconsistent, while other data showed long-term trends that appeared reliable. Where available, the long-term, reliable trends were identified within the section and

noted. Maps were produced that graphically showed the data on a section-by-section basis. These maps are included in the report in the appendix.

The analysis indicated that it was reasonable to expect groundwater depths less than 10 feet below ground surface within and immediately adjacent to the Gila and Salt rivers. Moving northward from the Gila and Salt rivers, the water table depth drops to 50 to 60 feet below ground surface along the northern boundary of the Study Area. Along the freeway corridors being evaluated, the groundwater depths range from 15 to 20 feet below ground surface between Cotton Lane and Avondale Boulevard and from 20 to 45 feet below ground surface between Avondale Boulevard and 51st Avenue.

Three potential locations for depressed traffic interchanges were considered to avoid major overhead power line relocations. The observed groundwater depths for these three sites were as follows:

- Bullard Avenue – 17 feet
- El Mirage Road – 20 feet
- 99th Avenue – 18 feet

At a typical fully depressed interchange, the pavement would be at a depth of about 25 feet. Ideally, the roadway subgrade and the utilities under the roadway (such as storm drainpipes) should remain above groundwater levels to avoid pavement failure and pipeline seepage and deterioration. As a result, groundwater depths shallower than 30 feet would likely be a major technical challenge.

### Groundwater Quality

After completing the groundwater depth analysis, the study evaluated the feasibility of dewatering a depressed interchange. Because the quality of the water being pumped would be a topic of concern, the Study Team researched the Arizona Department of Environmental Quality's (ADEQ) Superfund database to determine if any known contaminated areas are located in or around the Study Area. Two sites were identified: the West Van Buren Site and the Phoenix-Goodyear Airport South Site. The specific details of each of these two sites are summarized in the report and can be viewed at ADEQ's Web site at:

<http://www.azdeq.gov/environ/waste/sps/phxsites.html#pgasa>

The West Van Buren Site is approximately 1.5 miles north of the Study Area between 75th Avenue and 51st Avenue. The nearest depressed interchange to this Superfund site would be located at 99th Avenue south of Broadway Road, about 5 miles southwest of the plume. This distance would ensure that any dewatering activity at the interchange would not affect the plume of contaminated groundwater.

The southern end of the Phoenix-Goodyear Airport South Site is located at approximately Lower Buckeye Road and MC 85, or about 1.5 miles north of the depressed Bullard Avenue interchange location. This site is currently stable and is being contained with injection wells at the south end of the plume. Any groundwater dewatering activities in the vicinity could drastically affect the stability of the plume. Because the Bullard Avenue interchange site is located only 1.5 miles south and downstream of this Superfund site, a more detailed and comprehensive hydraulic analysis would be needed if this option of depressing the freeway is carried forward to determine if the Superfund plume stability would be compromised.

### Depressed Interchange Dewatering Feasibility

The Study Team explored the technical feasibility of dewatering a depressed interchange. To summarize the findings documented in the report shown in Appendix D, four groundwater dewatering wells would be required per interchange (one in each quadrant). Depending on the hydraulic conductivity and transmissivity of the soils in the area, the Study Team established a reasonable range of pumping rates

from 1,200 gallons per minute (gpm) to 4,000 gpm per interchange. This would have the net effect of lowering the groundwater level by approximately 20 feet per interchange.

Other dewatering issues would need to be analyzed further should a dewatering solution be pursued.

- Because of the agricultural history in the area, nitrate levels in the groundwater are anticipated to be too high to directly discharge back into the river environment. Consequently, treatment may be required to improve water quality before it can be discharged.
- Impacts to adjacent properties with wells could result from the groundwater table drawdown at the depressed interchange locations. This could result in requirements for additional compensation, well replacements, or full acquisition of properties affected by the groundwater table drawdown.
- A pump discharge outfall conveyance facility would be required. This study did not attempt to design such a system, although it is expected that this system would represent a significant cost to the project, especially if water quality treatments were incorporated into the facility.
- Urbanization of this part of the valley will affect the groundwater levels. However, it is not clear how the groundwater levels will react to urban development replacing irrigated farmland.

In summary, this effort concluded that while dewatering a depressed interchange is technically feasible, it would be an extremely challenging design effort, given the variables involved.

### Depressed Interchange Dewatering Cost Analysis

To fully assess the depressed interchange concepts, a dewatering cost analysis was developed. Various local and national resources were used to collect this data because this sort of activity is not common in Arizona. Construction costs, operations and maintenance (O&M) costs, and other incidental costs were evaluated and are summarized as follows:

- Construction of four dewatering wells per interchange – \$2 million to \$4 million, depending on well size, groundwater depth, and soil conditions
- Annual O&M costs – \$25,000 to \$65,000 per interchange
- Outlet conveyance facility, water quality treatment systems, right-of-way impacts, system redundancy costs, etc. – \$2 million to \$4 million, depending on specific site issues, but addressed by using a 100 percent contingency factor for the construction costs

Therefore, this study identified that a cost of \$7M (\$3M average construction cost plus \$3M contingency plus \$1 million O&M present value) be used for planning purposes for each depressed TI considered.

## 2.6 Structures

In order to perform a comparative analysis for the structures along the proposed SR 801 alternatives, the bridges have been divided into three classifications: overpass crossings, underpass crossings, and under crossings, which include all water crossings.

A preliminary bridge type was assumed for each classification and used for all corridors. The selected bridge type for this comparative analysis was based on general characteristics, such as span-to-depth ratios for the type of crossing, constructability considerations such as use of falsework and reputation of bridge type within this area. Site-specific considerations were evaluated using the selected bridge type to ensure feasibility and to further evaluate special needs. Examples of the special needs include potential impacts to utilities such as high voltage overhead power lines and the APS PVNGS pipeline. Bridge costs were adjusted to account for sites with special needs and are described in detail under the summaries.

Having one bridge type for each bridge classification is solely for the evaluation of the subsections. Once a recommended solution has been selected, a more refined analysis would determine the best structure type for each site.

### Superstructure Assumptions

**Overpass and Underpass:** Since the overpass and underpass crossings share similar characteristics, the same superstructure type was assumed for these two bridge classifications. An important characteristic that was considered was the ability of the superstructure to accommodate a variety of span lengths while maintaining a good span-to-depth ratio. This characteristic is especially important for the evaluation because only one structure type is being used, with a possible wide variation in required bridge lengths.

A cast-in-place, post-tensioned (CIP PT) concrete box girder bridge was assumed for the overpass and underpass bridge classifications. This bridge type is typically used for spans ranging from 100 feet to over 250 feet, which would accommodate all of the bridge crossings for this project. Typical span-to-depth ratios range from 1/22 to 1/25, giving the appearance of a slender superstructure, which is aesthetically attractive. This bridge type has historically been an economical alternative for these types of crossings and has been commonly used in the Phoenix metropolitan area.

There are numerous locations with high voltage overhead power lines in the Study Area. A CIP PT box girder bridge is a preferable superstructure type for this condition because it does not require the use of cranes for setting girders. In addition, because SR 801 would be a new alignment, the underpass could be built on soffit fill to avoid potential conflicts with the overhead power lines during the falsework erection. Traffic on an existing roadway would have to be temporarily diverted for construction of the CIP PT box girder bridges built on either soffit fill or falsework.

The bridge span lengths for the overpass bridge classifications were set based on an assumed ultimate typical section for the arterial roadways underneath SR 801. The municipalities each have their own ultimate typical roadway sections; however, for comparative purposes, the widest ultimate configuration was assumed for all crossings. This configuration would have to be revised if the design progresses. The assumed typical section includes three 12-foot-wide through lanes, two 12-foot-wide left-turn lanes, a 6-foot-wide bike lane, and a 6.5-foot-wide sidewalk in each direction—all separated by an 8-foot-wide median. This roadway section, in combination with an assumed width of 34 feet to accommodate 2:1 side slopes while maintaining a minimum 16.6 foot vertical clearance, yields a base span length of 115 feet (a 230-foot-long overall bridge length), without a skew. Span lengths were increased for the sites with a skew.

The one exception to the arterial roadway section is the Southern Avenue bridge crossing associated with the Subsection 2c alternatives. Southern Avenue is classified as a minor arterial street; therefore, a narrower roadway section was assumed. This roadway section includes two 12-foot-wide through lanes, a 6-foot-wide bike lane, and a 6.5-foot-wide sidewalk in each direction—all separated by a 12-foot-wide, two-way left-turn lane. In addition, this section assumed a 30 foot width to accommodate 2:1 side slopes while maintaining a minimum vertical clearance of 16.5 feet. This section yields a base span length of 77 feet (154-foot-long total bridge length) without a skew. A single span design may also be considered.

**Under Crossings:** The third bridge classification is the under crossings, which includes all water crossings. A pre-tensioned precast AASHTO Type VI girder was assumed for these under crossings. This type of superstructure is conducive to river crossings because it does not require the use of falsework, as does a CIP PT box girder bridge. Use of falsework in a riverbed increases the construction risks because of the possibility of flooding events.

The AASHTO Type VI girder is typically used to accommodate spans up to 130 feet. Longer spans are possible with less conventional girder spacing and an increase in girder lines. A preliminary girder analysis

was undertaken to optimize the girder span and span length. It was determined that a span length of 125 feet was optimal for maintaining reasonable initial and final concrete girder strengths, along with reasonable girder spacing.

The BWCCD Canal is the only exception to this third bridge classification. The SR 801 Subsection 1b alternative would need to span both the canal and the APS PVNGS pipeline, requiring a single-span bridge 200 feet in length. In order to span this crossing, a CIP PT box girder was assumed, which would require a superstructure depth of approximately 9 feet. Coordination during design and construction would need to occur to ensure that the APS pipeline is not affected.

**Cost Assumptions:** A cost estimate was made for a CIP PT box girder and an AASHTO Type VI girder, which were estimated at \$110 per square foot and \$120 per square foot, respectively. Each bridge site was then evaluated for site-specific considerations such as potential utility conflicts, drainage conflicts, scour, deck drainage, and geotechnical concerns and the appropriate cost adjustments were applied.

### Substructure Assumptions

Stub abutments founded on drilled shafts were assumed for all bridge classifications. At the Agua Fria River crossing, the assumed scour depth is 40 feet for the 100-year flood event.

### Bridge Layouts

Detailed bridge layout information can be found on each of the following bridges in the plans in Appendix A. Tables 2.5 to 2.14 summarize the bridges required for each alternative subsection.

**Table 2.5 – Bridge Summary, Subsection 1a**

Location	Crossing type	Number of spans	Bridge length (feet)	Bridge width (feet)	Deck area (square feet)	Special issues
Cotton Lane	TIOP	2	238	178	42,364	
Sarival Avenue	TIOP	2	238	178	42,364	
UPRR/MC 85	Under cross	6	1100	200	220,000	Railroad, utilities (fiber optic and petroleum pipelines), long span solution, traffic control

**Table 2.6 – Bridge Summary, Subsection 1b**

Location	Crossing type	Number of spans	Bridge length (feet)	Bridge width (feet)	Deck area (square feet)	Special issues
Cotton Lane	TIOP	2	238	178	42,364	
Buckeye Irrigation Canal	Under cross	1	200	206	41,200	APS pipeline, trails
Sarival Avenue	TIOP	2	238	178	42,364	

**Table 2.7 – Bridge Summary, Subsections 2a-1 and 2a-2**

Location	Crossing type	Number of spans	Bridge length (feet)	Bridge width (feet)	Deck area (square feet)	Special issues
Estrella Parkway	TIOP	2	230	182	41,860	
Bullard Wash	Under cross	2	225	245	55,125	Gabion Mats, trails
Bullard Avenue	TIOP	2	230	182	41,860	
Agua Fria River	Under cross	15	1,875	206	386,250	Scour, deck drainage, 345 kV overhead power line, trails
Dysart Road	TIOP	2	230	182	41,860	
El Mirage Road	TIOP	2	230	182	41,860	230 kV and 500 kV power line relocations
Avondale Blvd.	TIOP	2	230	182	41,860	
107th Avenue	TIOP	2	230	182	41,860	
99th Avenue	TIOP	2	230	182	41,860	

**Table 2.8 – Bridge Summary, Subsection 2b-1**

Location	Crossing type	Number of spans	Bridge length (feet)	Bridge width (feet)	Deck area (square feet)	Special issues
Estrella Parkway	TIOP	2	230	182	41,860	
Bullard Wash	Under cross	2	225	246	55,350	Gabion Mats, trails
Bullard Avenue	TIOP	2	244	182	44,408	230, 345, and 500 kV power line relocations, APS pipeline
Agua Fria River	Under cross	42	5,250	209	1,097,250	Scour, deck drainage, trails, DRCC detention basin
Dysart Road	TIOP	2	230	182	41,860	
El Mirage	TIOP	2	234	182	42,588	
Avondale Blvd.	TIOP	2	242	182	44,044	
107th Avenue	TIOP	2	230	182	41,860	
99th Avenue	TIOP	2	230	182	41,860	

**Table 2.9 – Bridge Summary, Subsection 2b-2**

Location	Crossing type	Number of spans	Bridge length (feet)	Bridge width (feet)	Deck area (square feet)	Special issues
Estrella Parkway	TIOP	2	230	182	41,860	
Bullard Wash	Under cross	2	225	242	54,450	Gabion Mats, trails
Bullard Avenue	TIOP	2	230	182	41,860	
Agua Fria River	Under cross	37	4,625	205	948,125	Scour, deck drainage, trails, APS pipeline, overhead power lines, DRCC detention basin
Dysart Road	TIOP	2	232	182	42,224	
El Mirage	TIOP	2	234	182	42,588	500 kV power line relocation
Avondale Blvd.	TIOP	2	230	182	41,860	
107th Avenue	TIOP	2	230	182	41,860	
99th Avenue	TIOP	2	230	182	41,860	

**Table 2.10 – Bridge Summary, Subsection 2c-1**

Location	Crossing type	Number of spans	Bridge length (feet)	Bridge width (feet)	Deck area (square feet)	Special issues
Estrella Parkway	TIOP	2	230	182	41,860	
Bullard Wash	Under cross	2	225	246	55,350	Gabion Mats, trails
Bullard Avenue	TIOP	2	244	182	44,408	230, 345, and 500 kV power line relocations, APS pipeline
Agua Fria River	Under cross	42	5,250	208	1,092,000	Scour, deck drainage, trails, overhead power lines, DRCC detention basin
Dysart Road	TIOP	2	246	182	44,772	
Southern Avenue, West	OP	2	302	206	62,212	St. Johns Canal
El Mirage Road	TIOP	2	248	182	45,136	
Avondale Blvd.	TIOP	2	230	182	41,860	
Southern Avenue, East	OP	2	164	224	36,736	St. Johns Canal
107th Avenue	TIOP	2	258	182	46,956	
99th Avenue	TIOP	2	260	182	47,320	500 kV power line relocation, APS pipe line

**Table 2.11 – Bridge Summary, Subsection 2c-2**

Location	Crossing type	Number of spans	Bridge length (feet)	Bridge width (feet)	Deck area (square feet)	Special issues
Estrella Parkway	TIOP	2	230	182	41,860	
Bullard Wash	Under cross	2	225	242	54,450	Gabion Mats, trails
Bullard Avenue	TIOP	2	230	182	41,860	
Agua Fria River	Under cross	40	5,000	209	1,045,000	Scour, deck drainage, trails, APS pipeline, overhead power lines, DRCC detention basin
Dysart Road	TIOP	2	246	182	44,772	
Southern Avenue, West	OP	2	302	206	62,212	St. Johns Canal
El Mirage Road	TIOP	2	248	182	45,136	
Avondale Blvd.	TIOP	2	230	182	41,860	
Southern Avenue, East	OP	2	254	222	56,388	St. Johns Canal
107th Avenue	TIOP	2	270	182	49,140	
99th Avenue	TIOP	2	230	182	41,860	

**Table 2.12 – Bridge Summary, Subsection 2c-3**

Location	Crossing type	Number of spans	Bridge length (feet)	Bridge width (feet)	Deck area (square feet)	Special issues
Estrella Parkway	TIOP	2	230	182	41,860	
Bullard Wash	Under cross	2	225	242	54,450	Gabion Mats, trails
Bullard Avenue	TIOP	2	230	182	41,860	
Agua Fria River	Under cross	23	2,875	206	592,250	Scour, deck drainage, trails, APS pipeline, overhead power lines
Dysart Road	TIOP	2	232	182	42,224	
El Mirage Road	TIOP	2	248	182	45,136	
Avondale Blvd.	TIOP	2	230	182	41,860	
107th Avenue	TIOP	2	230	182	41,860	
Southern Avenue, East	OP	2	270	206	55,620	St. Johns Canal
99th Avenue	OP	2	310	206	63,860	

**Table 2.13 – Bridge Summary, Subsection 3a**

Location	Crossing type	Number of spans	Bridge length (feet)	Bridge width (feet)	Deck area (square feet)	Special issues
91st Avenue	TIOP	2	238	182	43,316	69 kV power line relocation
Broadway Road	OP	2	337	210	70698	Large diameter sanitary sewer pipelines, 69 kV power line relocation, high skew
83rd Avenue	TIOP	2	230	178	40,940	69 kV power line relocation
75th Avenue	TIOP	2	230	192	44,160	Large diameter storm drain pipeline
67th Avenue	TIOP	2	230	206	47,380	Large diameter water pipeline
Ramp SW	Ramp	2	283	44	12,452	
Ramp EN	Ramp	4	1060	44	46,640	
Ramp NW	Ramp	6	1452	56	81,312	
Ramp ES	Ramp	4	1070	56	59,920	
NB Broadway Widening / SR 202L	OP	2	222	86	19,092	Large diameter sanitary sewer pipelines, traffic control
SB Broadway Widening / SR 202L	OP	2	222	86	19,092	Large diameter sanitary sewer pipelines, traffic control
NB Frontage Rd	OP	2	222	30	6,660	
SB Frontage Rd	OP	2	222	30	6,660	
NB Salt River Widening / SR 202L	Under cross	24	2955	84 (Avg.)	246,804	Scour, deck drainage, traffic control
SB Salt River Widening / SR 202L	Under cross	24	2955	78 (Avg.)	229,550	Scour, deck drainage, traffic control
Ramp NW / Southern Ave.	Ramp	1	232	57	13,224	
Ramp NW	Ramp	1	270	57	15,390	
Ramp ES / Southern Ave.	Ramp	1	232	Varies	16,100	
Ramp SE / Lower Buckeye Rd.	Ramp	5	790	42	33,180	
Ramp EN / Lower Buckeye Rd.	Ramp	2	240	46	11,040	
Lower Buckeye Tunnel	OP	NA	400	Varies	20,241	Lid Construction due to high skew crossing

**Table 2.14 – Bridge Summary, Subsection 3b**

Location	Crossing type	Number of spans	Bridge length (feet)	Bridge width (feet)	Deck area (square feet)	Special issues
91st Avenue	TIOP	2	238	182	43,316	69 kV power line relocation
83rd Avenue	TIOP	2	230	178	40,940	69 kV power line relocation
75th Avenue	TIOP	2	230	192	44,160	Large diameter storm drain pipeline
67th Avenue	TIOP	2	230	206	47,380	Large diameter water pipeline
Ramp EN	Ramp	9	2320	43.5	100,920	
Ramp NW	Ramp	28	4192	65.5	274,576	Scour, deck drainage
Ramp ES	Ramp	22	2920	76	221,920	Scour, deck drainage
Ramp SE / Lower Buckeye Rd.	Ramp	6	790	42	33,180	
Ramp EN / Lower Buckeye Rd.	Ramp	2	240	46	11,040	
Lower Buckeye Tunnel	OP	NA	400	Varies	20,241	Lid Construction due to high skew crossing
SB Frontage Rd.	OP	12	1751	39.5	69,165	
Ramp NW / Southern Ave.	Ramp	1	232	57	13,224	
Ramp NW	Ramp	1	270	57	15,390	
Ramp ES / Southern Ave.	Ramp	1	232	Varies	16,100	
Ramp SE / Ramp SW	Ramp	3	370	50	18,500	

## 2.7 Traffic

The traffic analysis for this study used the MAG travel demand model projections for 2030 traffic to:

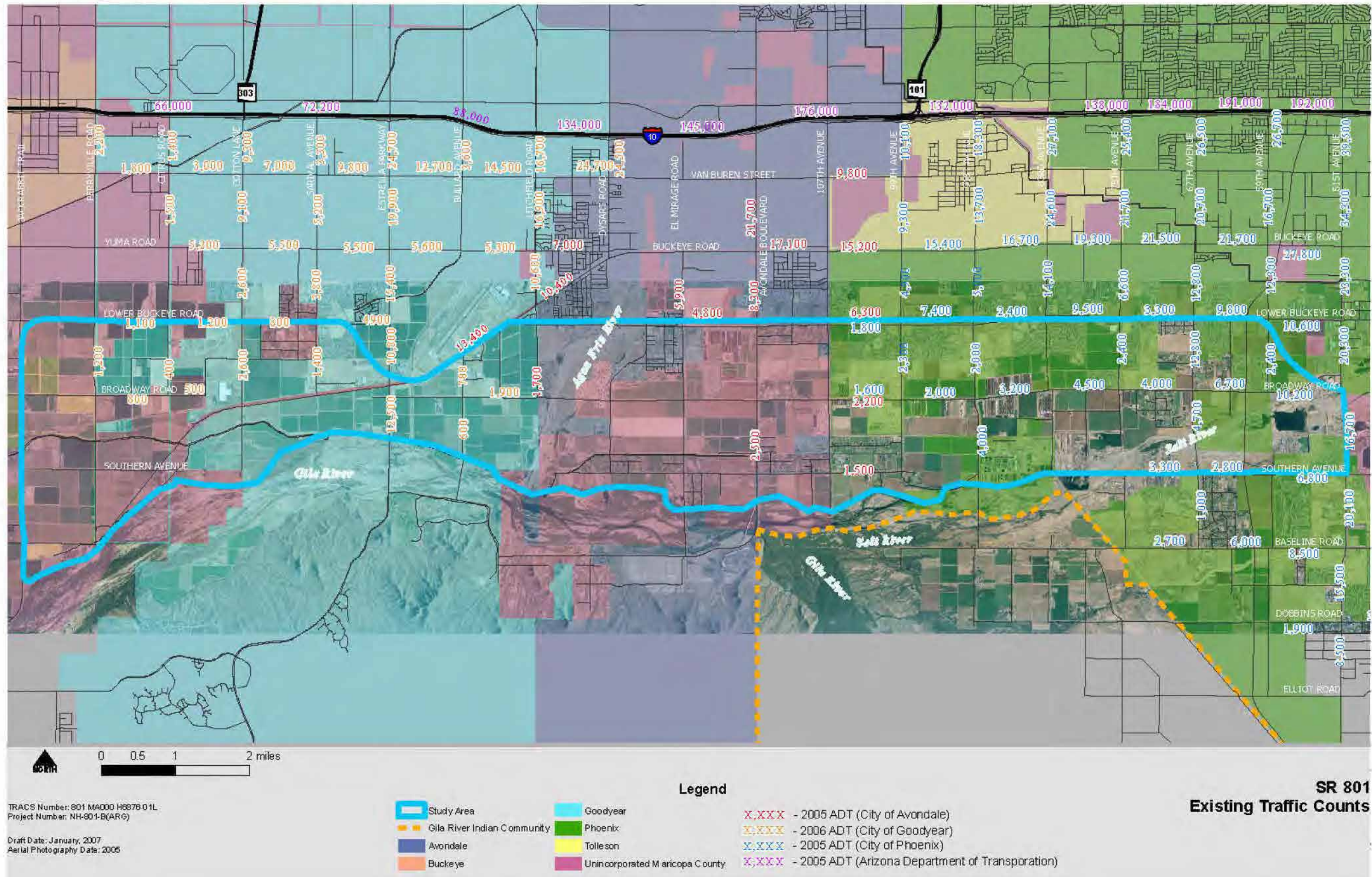
- Compare the demand for the mainline, service traffic interchanges, and system traffic interchanges
- Determine the lane requirements to provide a desirable LOS on the main line and system TI ramps

The major objectives of the proposed SR 801 freeway are to ease traffic on I-10 by providing additional east-west capacity in the region and to attract regional and local traffic from the arterial street system. Therefore, it is assumed that higher demand (more traffic) equates to a more desirable alternative. Additional traffic data can be found in the SR 801 *Initial Traffic Report* (May 2006).

### Existing Conditions

The most recent traffic count data from the Cities of Avondale, Goodyear, and Phoenix; ADOT; MAG; and MCDOT were reviewed. The existing ADT within and around the Study Area, based on the most recent data available, are presented in Figure 2.1. Existing traffic along arterial streets within the Study Area ranges from 1,000 to 17,000 vehicles per day (vpd).

Figure 2.1 – Existing Traffic Counts



## Future Network

The future road network within and around the Study Area was reviewed using the 2030 MAG travel demand model. The model road network includes all of the improvements in the RTP, along with anticipated improvements made by local, county, state, and private entities. The network is shown in Figure 2.2 and the major improvements are described below.

Almost all of the existing two-lane roadways within and around the Study Area are anticipated to be widened to at least four lanes in the next 25 years.

I-10 (Papago Freeway) is planned to be widened in 2023 between SR 85 and SR 303L to three general-purpose lanes in each direction. A 2008 to 2009 planned widening project between SR 303L and Loop 101 (SR 101L) would make I-10 a minimum of four general-purpose lanes and one HOV lane in each direction. I-10 is also planned to be widened by at least one additional general-purpose lane between SR 101L and I-17 in 2010. An ongoing project includes widening I-10 with one additional general-purpose lane in each direction between Verrado Way and Sarival Road. Proposed widening in this segment of I-10 is included in the model network based on recommendations from the SR 202L (South Mountain Freeway) *Draft Environmental Impact Statement (DEIS)* and the L/DCR.

SR 303L is planned to loop around the northwest valley from I-17 (Black Canyon Freeway) along the Lone Mountain alignment and then turning south along the Cotton Lane corridor. A connection to SR 74 (Carefree Highway) will be included. An extension of SR 303L south of I-10 is being studied and the final alignment has not been determined. The SR 303L section from I-10 to SR 801 is being planned for construction in 2018 to 2019 and is modeled with three general-purpose lanes in each direction and service traffic interchanges at major arterial streets.

SR 202L is planned to loop around the Phoenix South Mountain Park/Preserve from I-10 (Maricopa Freeway) at Pecos Road to I-10 (Papago Freeway) at approximately 55th Avenue. In June 2006, ADOT identified the 55th Avenue connection as the “preliminary preferred build alternative.” Additional alternatives that would connect to I-10 at approximately 71st Avenue and at SR 101L and the No-Action Alternative are also being evaluated in the DEIS. The final record of decision (ROD) is expected in 2008. The South Mountain Freeway would initially have three general-purpose lanes in each direction with an ultimate section of four general-purpose lanes and one HOV lane in each direction. SR 202L is modeled in its ultimate condition based on FHWA guidance.

SR 801 is planned to connect to SR 303L on the west and to SR 202L on the east. Both connections would be made using freeway-to-freeway directional ramps. SR 801 would initially have three general-purpose lanes in each direction, with an ultimate section of four general-purpose lanes and one HOV lane in each direction. Based on FHWA guidance, SR 801 is modeled in its ultimate condition (4+1) rather than what is funded (3+0). Additionally, SR 801 would ultimately be extended west of SR 303L to SR 85. This western extension is funded and modeled as an interim two-lane roadway with the long-term plan to provide a full freeway from SR 85 to the future SR 202L.

An enhanced six-lane arterial street called Avenida Rio Salado is being studied from the SR 801/SR 202L connection to 7th Street in Phoenix. The alignment is assumed to travel along the southern bank of the Salt River; however, this project was evolving at the time this report was being prepared. This facility may not connect to SR 202L and SR 801 for the foreseeable future.

## Future Conditions

The traffic analysis of the future conditions included four alternative alignments for SR 801 between SR 303L and SR 202L. The corridor designations and a short description can be found in Table 2.15.

**Table 2.15 – Traffic Alternative Analysis**

Corridor <sup>a</sup>	Location between Dysart Road and 99th Avenue	Connection to SR 202L
2a–3a	North of Southern Avenue	North of Broadway Road
2a–3b	North of Southern Avenue	South of Broadway Road
2c–3a	South of Southern Avenue	North of Broadway Road
2c–3b	South of Southern Avenue	South of Broadway Road

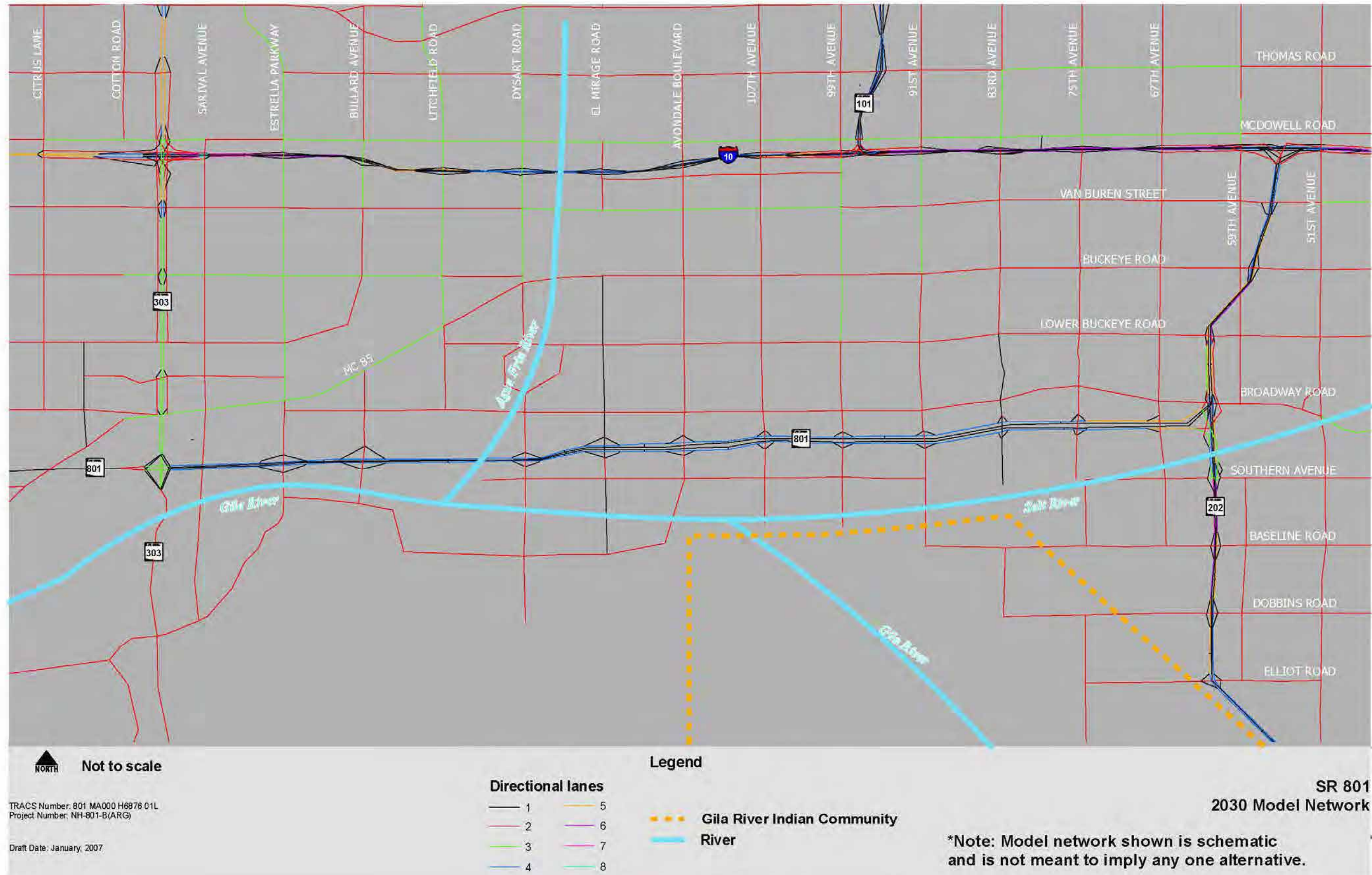
<sup>a</sup> All corridor designations are truncated. All corridors assume Subsection 1b is included.

The four corridor alternatives allow for comparisons between the North and South Alternatives through Avondale and between the connections to SR 202L. The following sections present the projected traffic operations of SR 801 and other facilities within and around the Study Area in 2030.

## Projected Traffic Operations, SR 801 Mainline, 2030

The projected traffic from the MAG travel demand model is presented for the corridor alternatives in Figures 2.3 to 2.6. For all of the alternatives, SR 801 was modeled assuming the ultimate condition of four general-purpose lanes and one HOV lane in each direction between SR 303L and SR 202L. The ADT volumes are shown for SR 801, including the system traffic interchanges and service traffic interchanges, surrounding arterial streets, I-10, SR 303L, and SR 202L.

Figure 2.2 – 2030 Model Network



TRACS Number: 801 MA000 H6876 01L  
Project Number: NH-801-B(ARG)

Draft Date: January, 2007



Figure 2.3 – Corridor 2a-3a Traffic Analysis

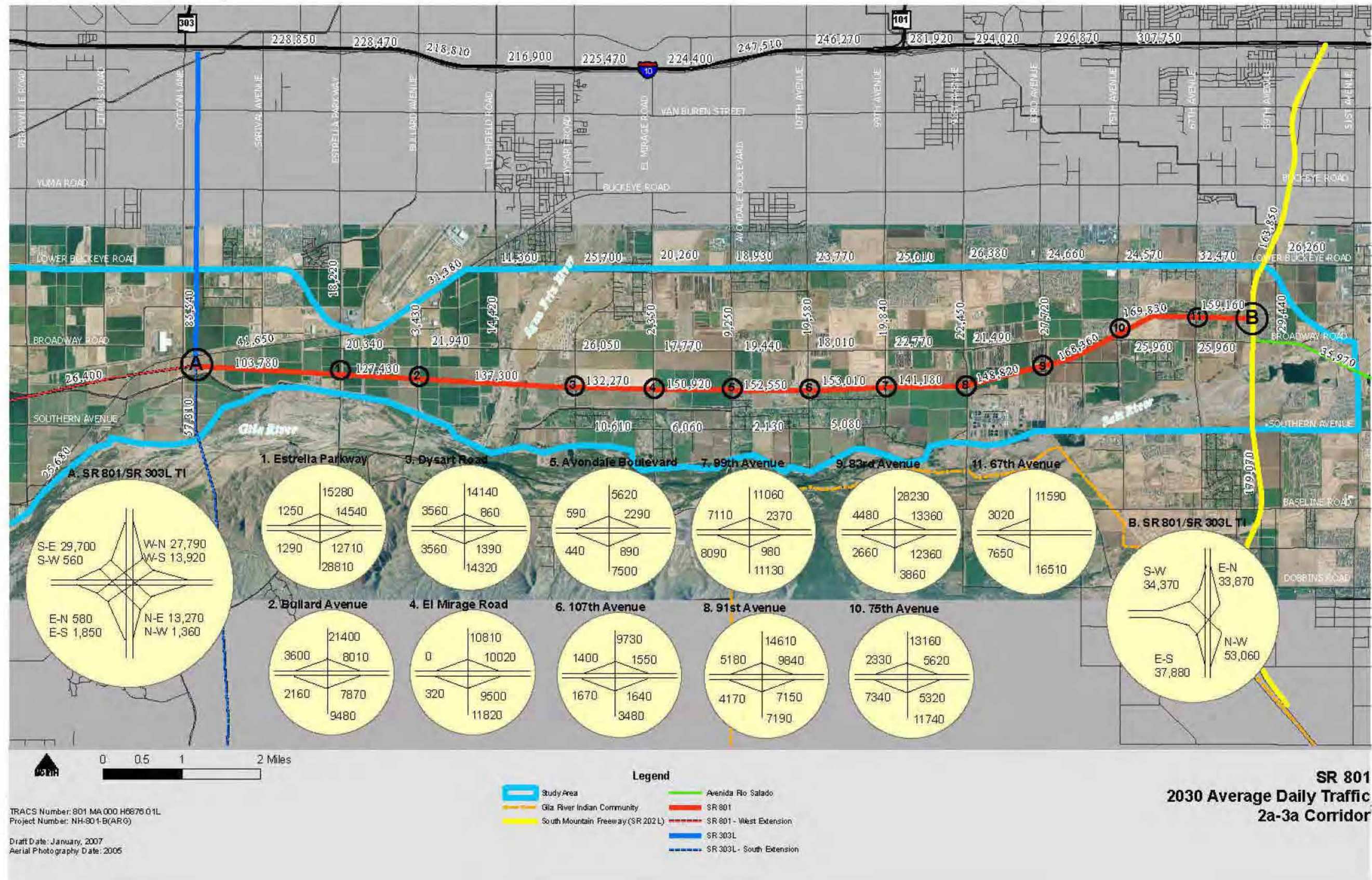


Figure 2.4 – Corridor 2a-3b Traffic Analysis

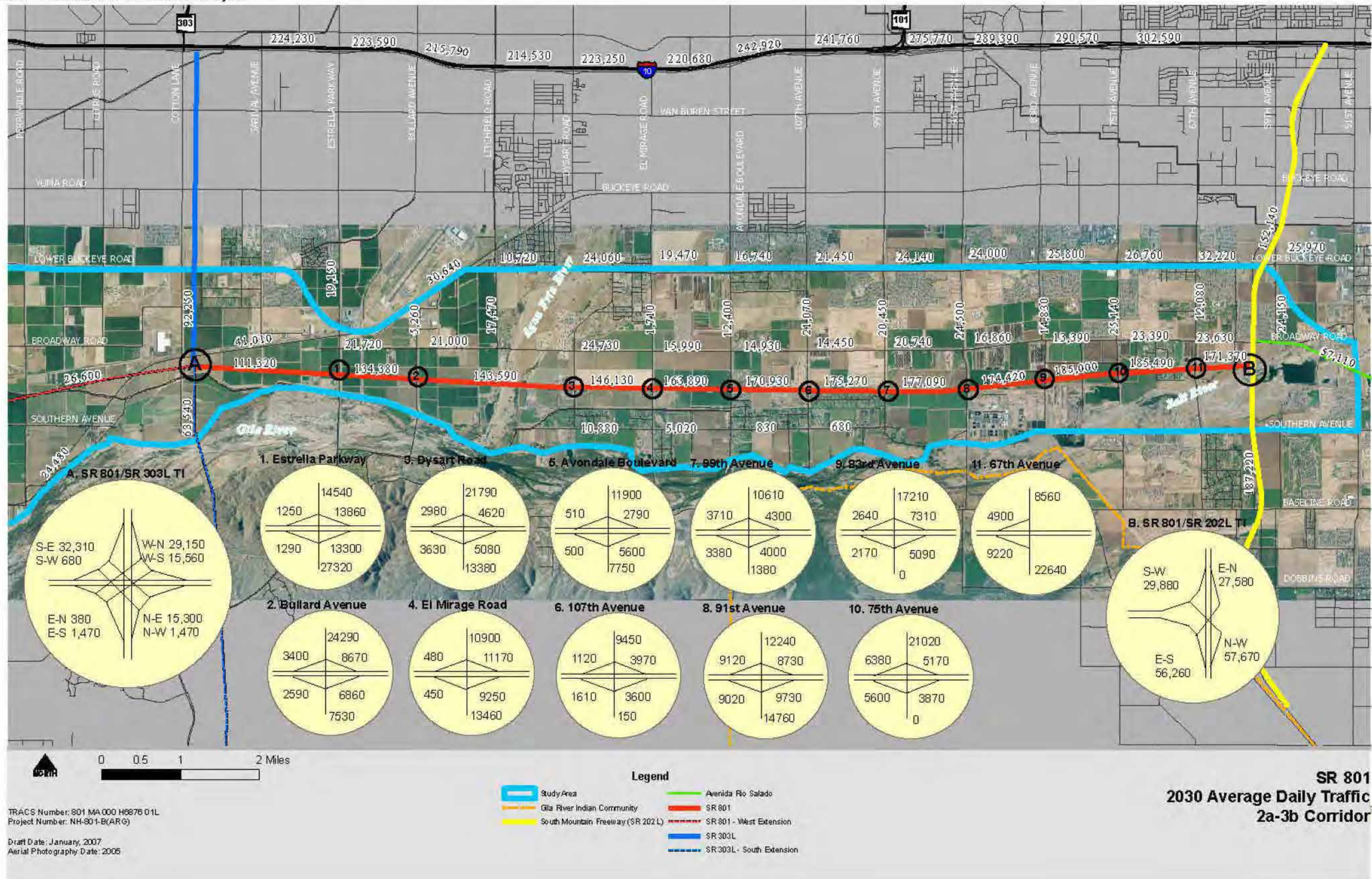


Figure 2.5 – Corridor 2c-3a Traffic Analysis

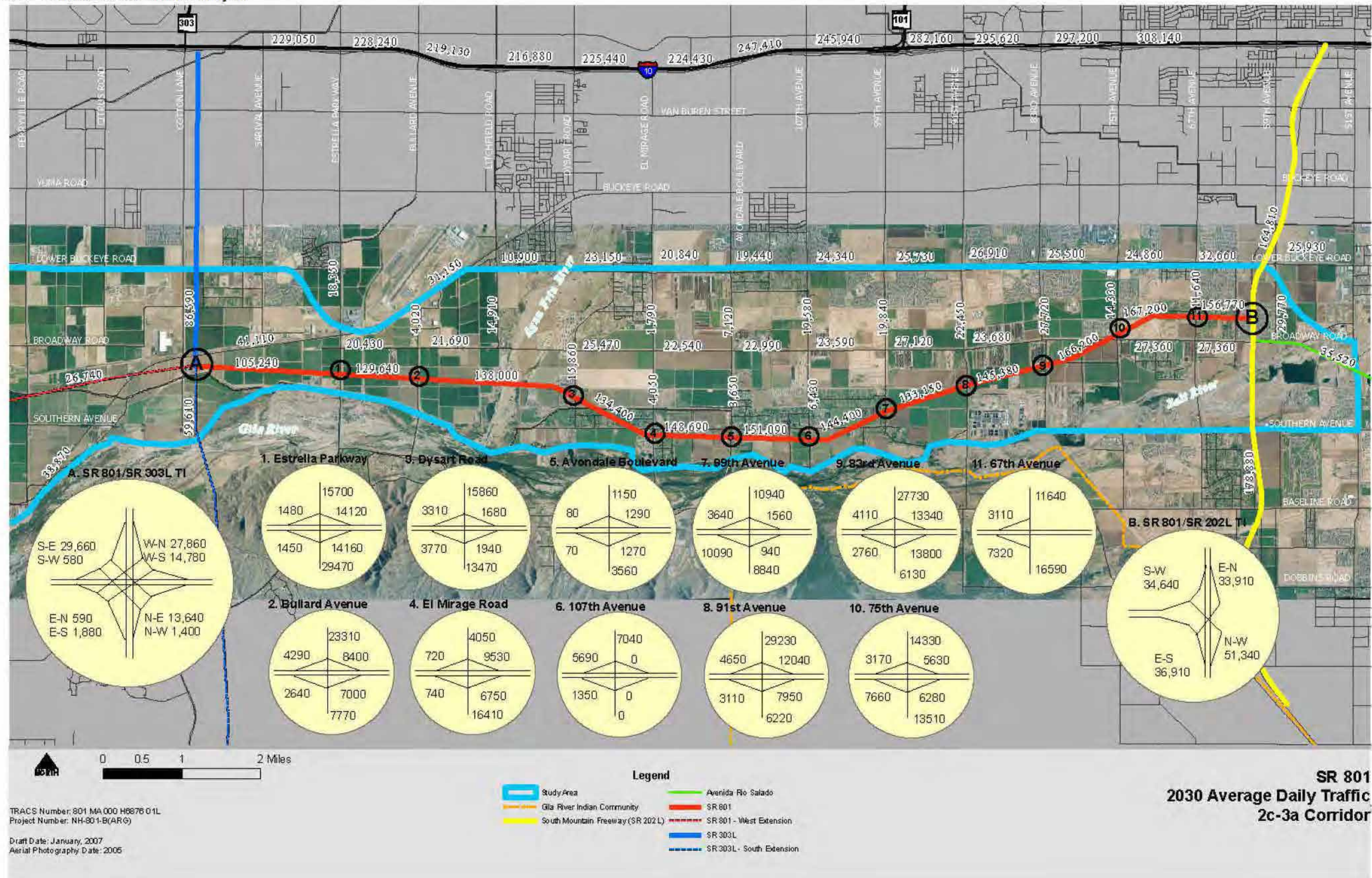
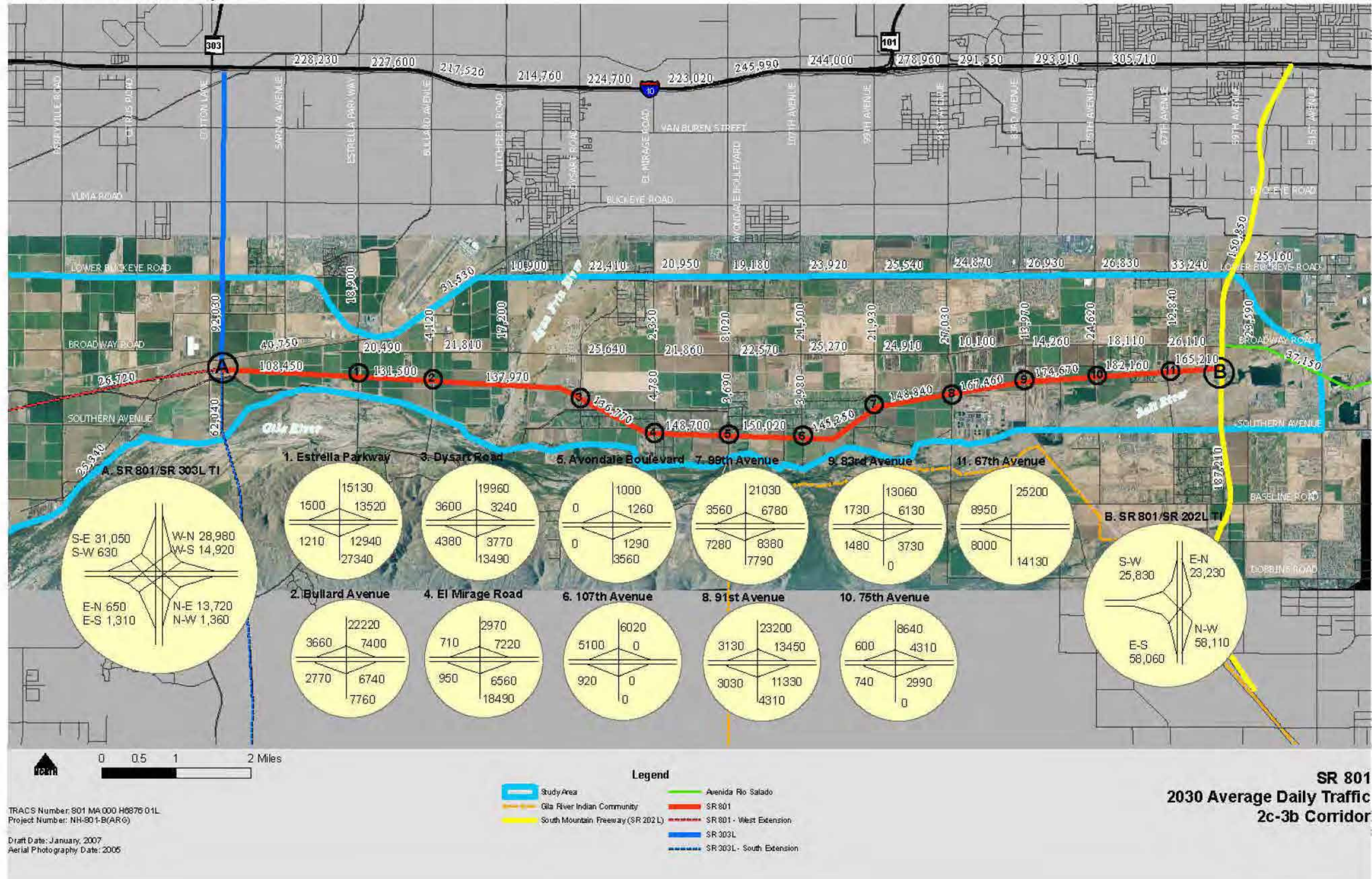
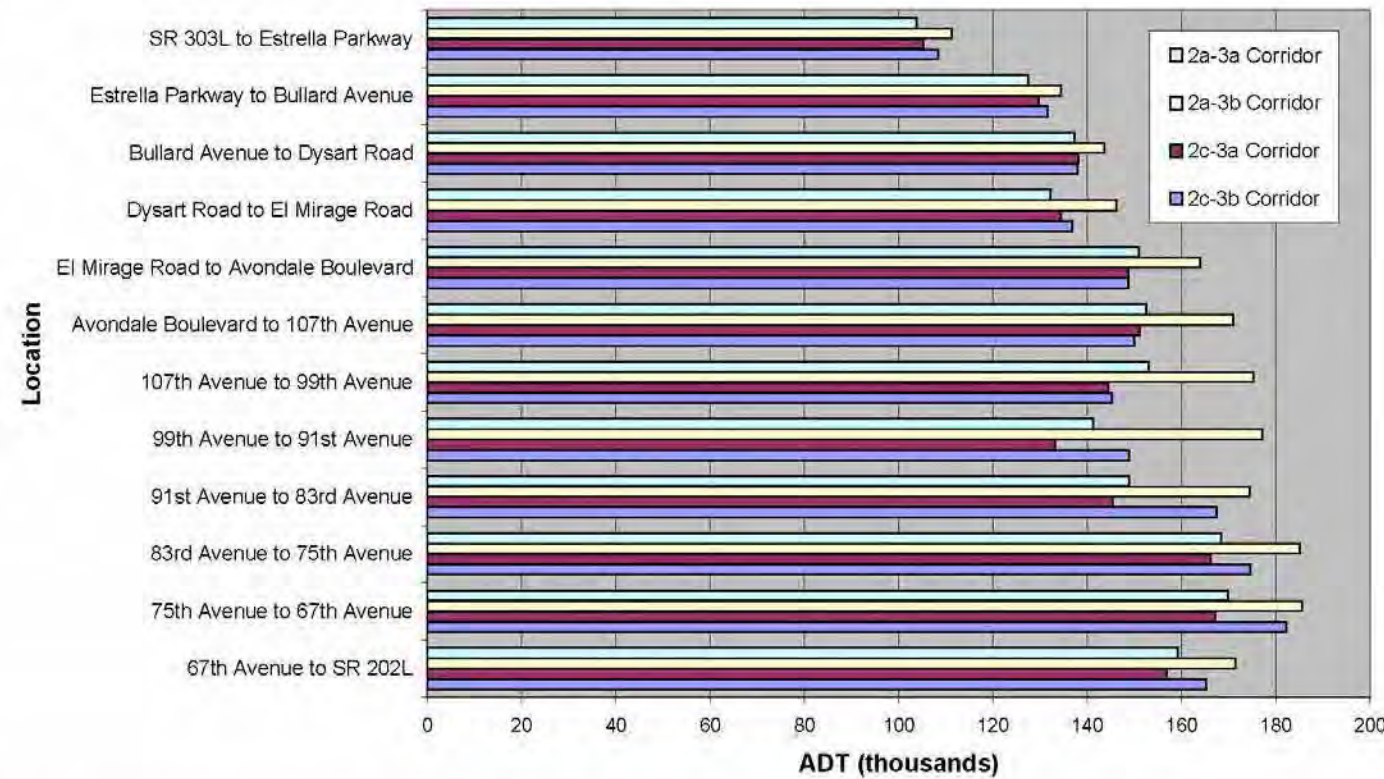


Figure 2.6 – Corridor 2c-3b Traffic Analysis



A comparison of the projected traffic on SR 801 among the alternative alignments is presented in the chart in Figure 2.7. This provides an indication of the relative attractiveness of each alternative.

Figure 2.7 – Projected Traffic, SR 801 Mainline, 2030



Notable observations from Figure 2.7 include:

- In all twelve of the segments, Subsection 2a attracts more traffic when paired with Subsection 3b, rather than with Subsection 3a.
- In nine of the twelve segments, Subsection 2c attracts more traffic when paired with Subsection 3b than with Subsection 3a. In the other three segments, traffic volumes on both corridors are equal or very close to equal.
- Corridor trip attraction appears to be strongly correlated with interchange location, with Subsection 3b being more attractive.
- In all twelve segments, Subsection 2a attracts more traffic than Subsection 2c when paired with Subsection 3b.
- In eight of the twelve segments, Subsection 2a attracts more traffic than Subsection 2c when paired with Subsection 3a.
- Corridor trip attraction appears to be strongly correlated with mainline alignment, with Subsection 2a being more attractive.
- The corridor alternative 2a-3b provides the strongest trip attraction, higher than any other alternative in every segment, by as much as 28,000 (~5%) vehicles per day.

Table 2.16 presents the total daily vehicle miles traveled along SR 801 between SR 303L and SR 202L. Overall, the 2a-3b corridor is the most attractive and the 2c-3a corridor is the least attractive.

Table 2.16 – Daily Vehicle Miles Traveled, 2030

Corridor	Daily vehicle miles traveled
2a-3a	1,946,000
2a-3b	2,151,000
2c-3a	1,924,000
2c-3b	2,002,000

The quality of service provided by a freeway is indicated by the LOS. LOS is a subjective rating system that takes into consideration the operating conditions of the facility in terms of traffic speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. The LOS may range from A (least congested) to F (most congested). To analyze the operational performance of SR 801, the peak-hour LOS during the morning and evening commutes was calculated using the MAG travel demand model peak-hour traffic volume forecasts. The travel demand model analysis provides the LOS based on the volume to capacity factor as well as the duration of traffic congestion.

All of the SR 801 corridors for the 2a-3a, 2c-3a, and 2c-3b corridors would operate at LOS D or better, based on the projected 2030 traffic volumes. Because of the higher traffic attraction to the 2a-3b corridor, two segments of this corridor would operate at LOS E in the westbound direction during the evening commute. The duration of the traffic congestion would be less than 1 hour. To reduce the level of congestion in these segments, an additional general-purpose lane could be provided or the service traffic interchange spacing could be increased. The results of the LOS analysis are presented in Table 2.17.

Table 2.17 – SR 801 Mainline LOS Analysis, 2030

Location	2a-3a Corridor		2a-3b Corridor		2c-3a Corridor		2c-3b Corridor	
	AM peak hour LOS	PM peak hour LOS	AM peak hour LOS	PM peak hour LOS	AM peak hour LOS	PM peak hour LOS	AM peak hour LOS	PM peak hour LOS
SR 303L to Estrella Parkway	A/C	C/B	A/C	C/B	A/C	C/B	A/C	B/B
Estrella Parkway to Bullard Avenue	A/C	D/C	B/C	D/C	A/C	D/C	A/C	D/C
Bullard Avenue to Dysart Road	A/C	D/C	B/C	D/C	A/C	D/C	B/C	D/C
Dysart Road to El Mirage Road	B/C	D/C	B/D	D/C	A/C	D/C	B/C	D/C
El Mirage Road to Avondale Blvd.	B/C	D/C	B/D	D/C	B/C	D/C	B/C	D/C
Avondale Blvd. to 107th Avenue	B/C	D/C	B/D	D/C	B/C	D/C	B/C	D/C
107th Avenue to 99th Avenue	B/C	D/C	B/D	D/C	A/C	D/C	B/C	D/C
99th Avenue to 91st Avenue	B/C	D/B	B/D	E/D	A/C	D/B	B/C	D/C
91st Avenue to 83rd Avenue	B/C	D/C	C/C	D/D	B/C	D/C	B/C	D/C
83rd Avenue to 75th Avenue	C/C	D/C	C/C	E/D	B/C	D/C	C/C	D/D
75th Avenue to 67th Avenue	B/C	C/C	B/C	D/D	B/C	C/C	B/C	D/D
67th Avenue to SR 202L	B/B	C/C	B/C	C/C	B/B	C/B	B/B	C/C

Note: westbound LOS/eastbound LOS; locations with LOS E or F are highlighted

### System Traffic Interchange Analysis

#### SR 801/SR 303L:

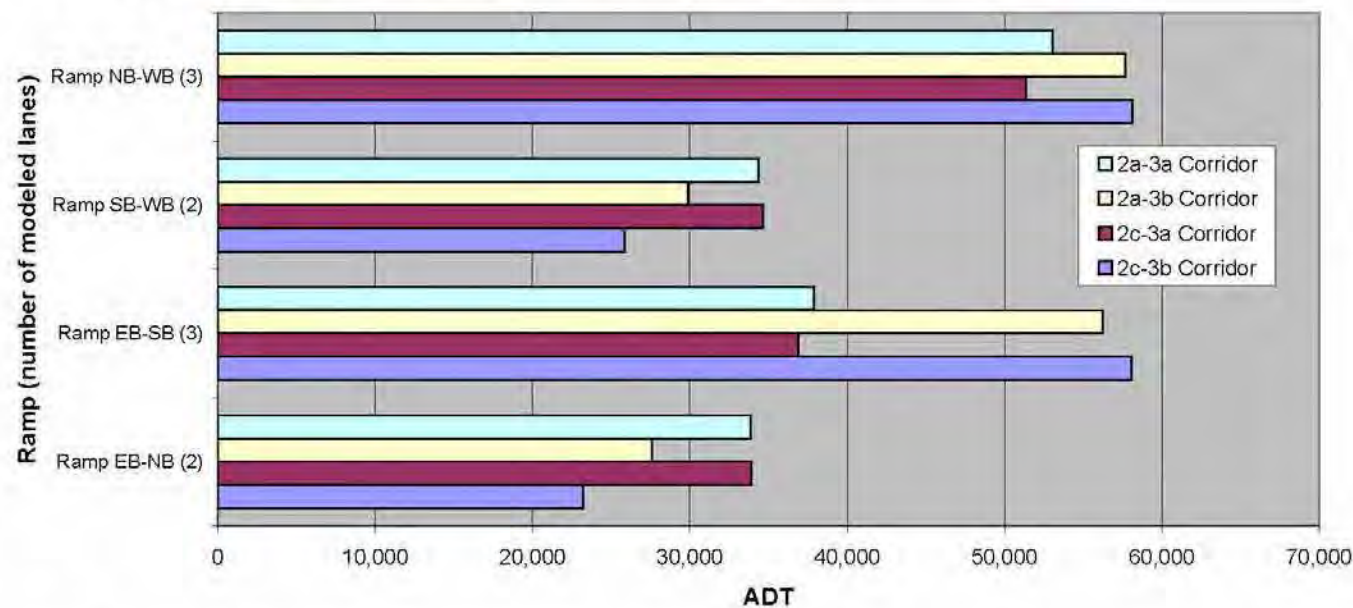
The SR 801/SR 303L connection would be made at a fully directional system traffic interchange that provides movements in all four directions with eight directional ramps (when considering a future SR 801 connection to the east and a future SR 303L connection to the south). The location and design of the SR 801/SR 303L system traffic interchange is still in a conceptual stage; therefore, all of the SR 801 alternative corridors assume a connection to the SR 303L at the same location with the same number of lanes for the directional ramps. For the purposes of this evaluation, the SR 801 / SR 303L TI is not studied in detail because the TI is included with the SR 303L (I-10 to SR 801) study. In addition, from traffic perspective, the size and configuration of the interchange is neutral to the SR 801 corridor selection.

#### SR 801/SR 202L:

The SR 801/SR 202L connection would be made at a directional system traffic interchange that provides movements in three directions with four directional ramps. The chart in Figure 2.8 presents the traffic on each directional ramp. Notable observations from Figure 2.8 include:

- The 3a corridors have stronger movement to and from the north.
- The 3b corridors have stronger movement to and from the south.
- The traffic on Ramp EB-SB is approximately 20,000 vehicles per day greater for 3b corridors than for 3a corridors.
- The other three ramps vary by 4,000 to 6,000 vpd among the alternative connections.

Figure 2.8 – Projected Traffic, SR 801/SR 202L System Traffic Interchange, 2030



As

hour was used for three-lane analysis. Table 2.18 presents the number of lanes required on each directional ramp to accommodate the projected 2030 peak-hour traffic at LOS D or better. Notable observations from Table 2.18 include:

- Three lanes would be required for Ramp NB-WB for all alternatives.
- The 3a corridor would not require three lanes for Ramp EB-SB.

Table 2.18 – SR 801/SR 202L System Traffic Interchange Lane Requirements

Corridor	SR 801/SR 202L system traffic interchange ramp			
	SB-WB	EB-NB	EB-SB	NB-WB
2a-3a	2	2	2	3
2a-3b	2	2	3	3
2c-3a	2	2	2	3
2c-3b	2	2	3	3

Notes: WB = westbound; EB = eastbound; NB = northbound; SB = southbound  
Shading designates the LOS of the ramp (LOS A - no shading, B - green, C - yellow, and D - orange)

### Service Traffic Interchange Analysis

For the purposes of this alternatives selection process, the SR 801 alternatives assume service traffic interchanges at all of the major north-south arterial streets except for Litchfield Road because of the Agua Fria River crossing. The final locations of the service traffic interchanges would be coordinated between ADOT and the local jurisdictions. Table 2.19 presents the total projected 2030 daily traffic that would use a service traffic interchange for each corridor. Individual ramp volumes can be found in Figures 2.3 to 2.6. Notable observations from the table and figures include:

- The 2a-3b corridor attracts more local vehicles than any other corridor.
- The 2c-3b corridor attracts the least local traffic of all corridors.
- The demand is highest for the service traffic interchanges at Estrella Parkway and 91st Avenue.
- The demand is lowest for the service traffic interchanges at Avondale Boulevard and 107th Avenue.

Table 2.19 – Total ADT on Service Traffic Interchanges, 2030

Corridor	ADT
2a – 3a	200,100
2a – 3b	212,900
2c – 3a	202,900
2c – 3b	184,300

Note: WB = westbound; EB = eastbound; NB = northbound; SB = southbound

stated previously, the HCM notes that the capacity of a one-lane directional ramp is 2,100 passenger cars per hour and the capacity of a two-lane directional ramp is 4,100 passenger cars per hour. There is no discussion of a three-lane directional ramp, but because the projected traffic volume on two of the directional ramps is greater than the two-lane capacity, an assumed capacity of 6,100 passenger cars per

### Projected Traffic Operations, Study Area, 2030

This section focuses on any trends or differences in the 2030 traffic projections for the adjacent arterial streets and freeways among the SR 801 alignment alternatives.

#### Cut-Line Analysis

A cut-line analysis was conducted to determine if the distribution of traffic between arterial streets and freeways was different among the SR 801 alternative alignments. A cut-line is a representative line, usually perpendicular to the traffic flow being analyzed, that cuts through model network roadway segments (freeways and major arterial streets). The two cut-lines used are located between Estrella Parkway and Bullard Avenue from Thomas Road to Southern Avenue and between 83rd Avenue and 91st Avenue from Thomas Road to Southern Avenue. The results of the cut-line analysis are presented in Tables 2.20 and 2.21.

**Table 2.20 – Cut-Line 1: Vehicles per Day between Bullard Avenue and Estrella Parkway from Thomas Road to Southern Avenue**

Roadway	2a-3a Corridor	2a-3b Corridor	2c-3a Corridor	2c-3b Corridor
Total freeway	375,340	377,500	377,670	378,840
Total arterial street	149,490	149,110	146,850	148,190
<b>Total</b>	<b>524,830</b>	<b>526,610</b>	<b>524,520</b>	<b>527,030</b>
Percent freeway	71.5%	71.7%	72.0%	71.9%
Percent arterial street	28.5%	28.3%	28.0%	28.1%

Notable observations from the western cut-line (cut-line 1) analysis include:

- There is little or no difference in the traffic distribution between arterial streets and freeways among the SR 801 alternative alignments.
- The demand for I-10 and SR 801 are highly independent of the location of the SR 801 alignment or SR 801/SR 202L system traffic interchange.

**Table 2.21 – Cut-Line 2: Vehicles per Day between 91st Avenue and 83rd Avenue from Thomas Road to Southern Avenue**

Roadway	2a-3a Corridor	2a-3b Corridor	2c-3a Corridor	2c-3b Corridor
Total freeway	471,520	493,530	468,480	487,800
Total arterial street	152,520	147,140	154,910	148,760
<b>Total</b>	<b>624,040</b>	<b>640,670</b>	<b>623,390</b>	<b>636,560</b>
Percent freeway	75.6%	77.0%	75.2%	76.6%
Percent arterial street	24.4%	23.0%	24.8%	23.4%

Notable observations from the eastern cut-line (cut-line 2) analysis include:

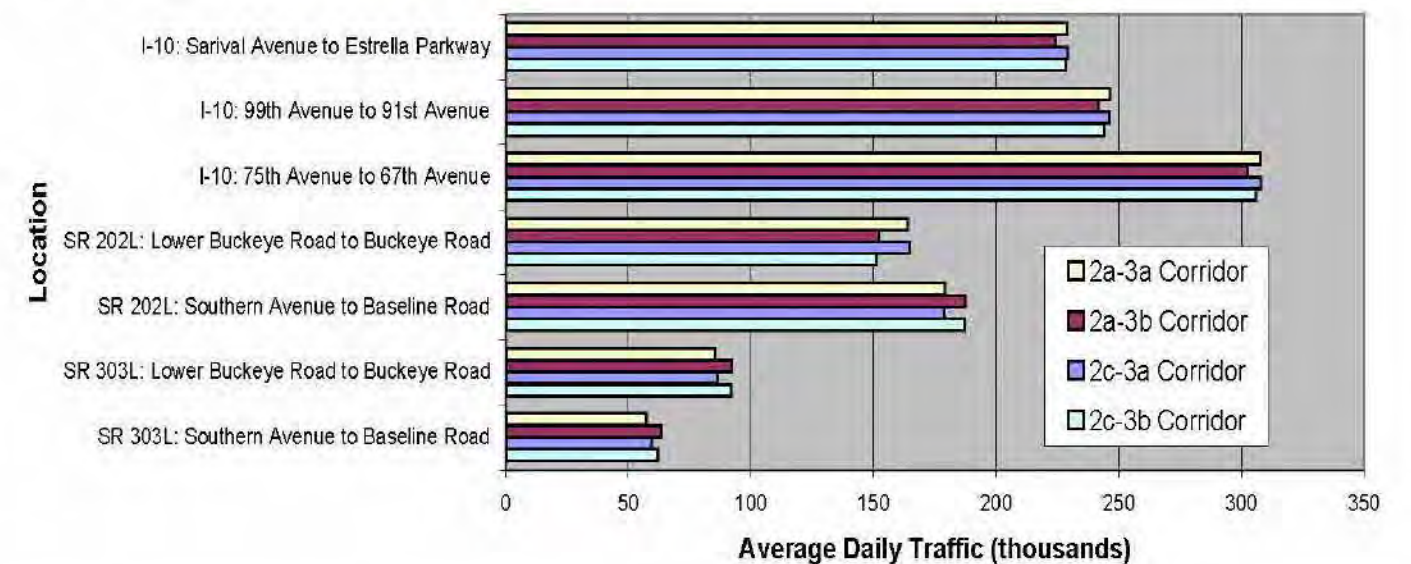
- The 3b corridors attract approximately 20,000 more freeway trips than the 3a corridors. This shows a stronger attraction for this alternative.
- The approximate 15,000 vpd difference in total trips (freeway plus arterial street) through the corridor indicates that the 3b corridors attract vehicles from outside of the cut-line limits. This indicates that there is more congestion relief of parallel arterial streets using Subsection 3b.

- The 3b corridors decrease arterial street traffic by 5,000 to 6,000 vpd when compared with the 3a corridors.
- Freeway trip attraction is considerably stronger for the 3b corridors, and strongest for the 2a-3b corridor.

#### Adjacent Freeway Traffic

The projected traffic for affected freeways in the Study Area is presented in the chart in Figure 2.9. Alternatives with stronger trip attraction increase the demand on SR 202L to the south because that is the dominant directional movement. These alternatives also decrease the demand on SR 202L north of SR 801 and on I-10 west of SR 202L by providing additional capacity for travel between points southeast and northwest of the corridor. The higher attraction alternatives also increase traffic demand on SR 303L.

**Figure 2.9 – Projected Traffic on Freeways, 2030**



Notable observations from Figure 2.9 include:

- Along I-10, the projected traffic volume is about 5,000 vehicles per day lower with the 3b corridors and is lowest for the 2a-3b corridor. Lower I-10 traffic implies greater traffic relief value.
- The projected traffic on SR 202L south of the system traffic interchange is approximately 5 percent greater for the 3b corridors than for the 3a corridors.
- The projected traffic on SR 202L north of the system traffic interchange is approximately 8 percent greater for Subsection 3a than Subsection 3b.
- Traffic on SR 303L is consistently higher in both directions with Subsection 3b than with Subsection 3a.

## Traffic Recommendations and Conclusions

### Travel Demand Analysis

- Subsection 3b is more attractive than 3a for regional travel demand.
- Subsection 2a is more attractive than 2c for regional travel demand.
- Corridor 2a-3b is the most attractive for both regional travel demand and local travel demand.
- Corridor 2c-3a is the least attractive for regional travel demand, but is the second most attractive for local travel demand.
- Corridor 2a-3b provides the greatest trip reduction to adjacent arterial streets and I-10.

### Lane Requirement Analysis

- The 2a-3b corridor may require additional westbound lanes or modifications to the service traffic interchange locations between 99th Avenue and SR 202L. Lane requirements for all other segments of main line are the same for all alternatives.
- From a traffic perspective, the SR 801 / SR 303L TI size and configuration is neutral to the SR 801 corridor selection process.
- At the SR 801/SR 202L TI, the Subsection 3b TI layouts require three lanes for Ramp EB-SB versus two lanes for the Subsection 3a TI layouts; other ramps are the same for all alternatives.

## 2.8 Phoenix-Goodyear Airport

In the fall of 2007, the Phoenix-Goodyear Airport will publish its draft master plan study. Figure 2.11 shows the preferred concept for the airport. As this exhibit shows, the major feature relevant to the SR 801 corridor is the addition of a second runway that is parallel to and southeast of the existing runway 3-21. However, runway 3-21 will still be the primary runway and the critical Part 77 glide slope surfaces extending from the runways will still be controlled by runway 3-21.

The Study Team evaluated the existing and proposed Part 77 surfaces for the existing runway 3-21. The draft master plan indicates that the southwest end of the runway is ultimately planned to be a "nonprecision" approach, indicating that a 34:1 Part 77 glide slope should be used to evaluate the proposed SR 801 location.

Because airport master plans are updated about every 5 years and because the freeway may not be built for 15 years, the Study Team also evaluated the end of the runway using a 50:1 glide slope, which corresponds to a "precision" approach. While there is no indication that the airport will upgrade this runway to this type of approach, it is prudent to evaluate this option, should plans change in the future. A 50:1 glide slope is the flattest (and, therefore, the most conservative) glide slope designated by the Federal Aviation Administration (FAA).

To perform this analysis, one more surface must be defined. A 100:1 sloped surface surrounding the edge of the runway defines a surface that dictates whether FAA Form 7460 must be submitted. If any element of the proposed work (permanent or temporary) penetrates this 100:1 surface, that work element must be included in Form 7460. However, a penetration of the 100:1 surface does not imply that this element would be designated as an obstruction. The element is only an obstruction if it penetrates the actual Part 77 surface designated for that runway, or, in our case, 34:1 based on the most current available information.

A profile was developed down the centerline of runway 3-21 extending southwest across the Gila River. Overlaid on this profile is the 34:1 Part 77, a theoretical 50:1 Part 77, and the 100:1 Test Surface. Also included is SR 801, shown in its highest profile option at that location. The highest element on a freeway is

typically the lighting. A 69-foot-high, median-mounted light pole is shown. This profile is shown in Figure 2.10.

As this exhibit shows, the light poles immediately southwest of the end of the runway would penetrate the 100:1 surface (thus requiring a Form 7460) but do not penetrate the 34:1 or the 50:1 surface. Therefore, the FAA would likely not classify these light poles as obstructions, especially considering the existing overhead power lines in the area that would still be higher than any of the proposed SR 801 elements. In addition, because of the proximity of the proposed project to the airport, Form 7460s would likely be needed for the temporary use of cranes for the bridge sites adjacent to the airport.

If a build alternative is ultimately selected, other detail items will need to be coordinated with the airport and the FAA. These items would include:

- Spill light from freeway luminaries – downward facing lamps and / or light shields would need to be considered in the design for both the roadway and the sign lights under the runway approaches. Reduced freeway lighting concepts would also be favored by the airport.
- Freeway luminaire light color – The airport uses pure white lights on the airfield. The airport would prefer that the freeway lighting underneath the runway approach surfaces use off-white lamps to avoid possible pilot confusion.
- Signing - freeway signing along the SR 801 directing traffic to the airport would need to be coordinated.
- Special event traffic – the airport occasionally hosts airshows at the airport, in the past drawing up to 25,000 people. SR 801 would become the likely route for traffic to access this event. Access would occur along the west side of the airport, which would correspond to the Estrella Parkway interchange.
- Drainage Detention Basins – the airport would have some concerns about any standing water ponds or basins in line with the end of the runways, since they attract birds, which could be a hazard for aircraft. Final design efforts should attempt to avoid such conditions or, if unavoidable, provide mitigation as necessary.

The Internet link for the Phoenix-Goodyear Airport follows:

<http://phoenix.gov/goodyearairport/index.html>



Figure 2.10 – Phoenix-Goodyear Airport Part 77 Evaluation (Not to Scale)

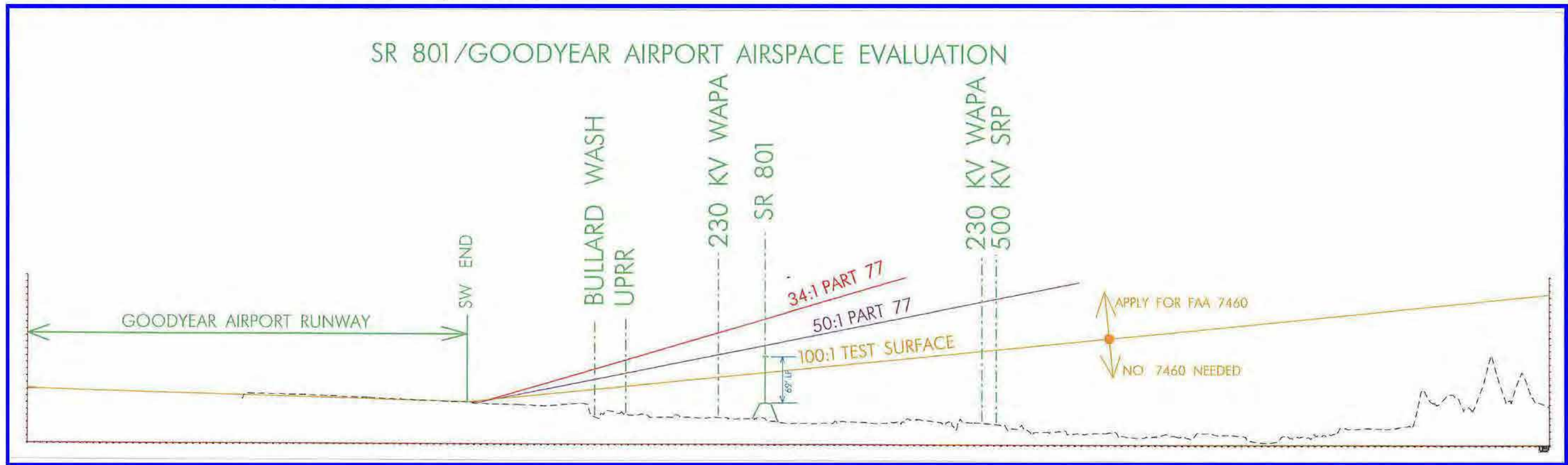
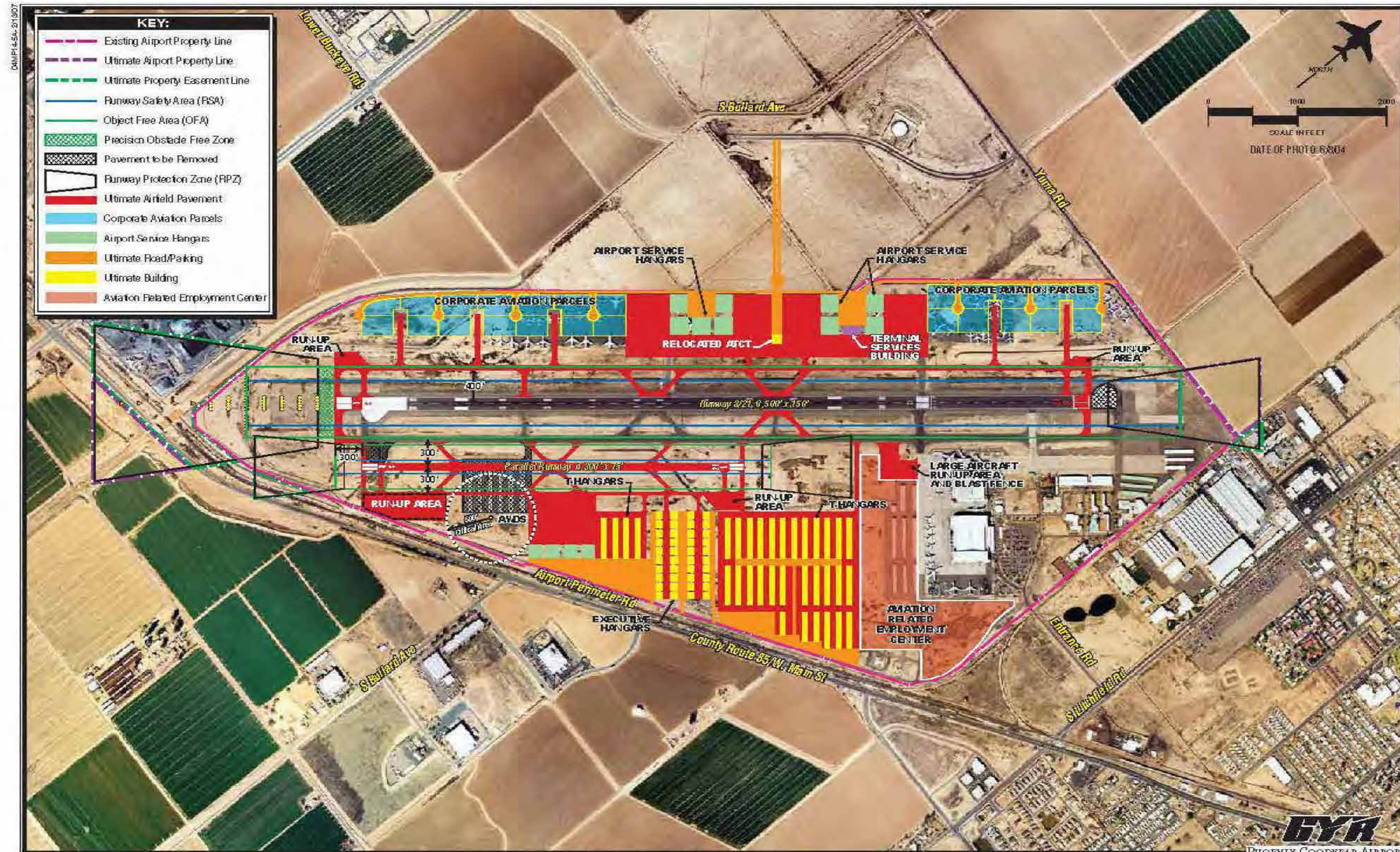


Figure 2.11 – Phoenix-Goodyear Airport Draft Master Plan Layout



**BYA**  
PHOENIX GOODYEAR AIRPORT  
Exhibit 5A  
RECOMMENDED MASTER  
PLAN CONCEPT

## 2.9 Utilities

### Summary

There are a number of utilities within the SR 801 Study Area. All utility companies were contacted and utility as-builts and system quad-maps were collected when available. Major utilities were mapped from this information and can be seen on the plans in Appendix A.

In terms of planning the SR 801 freeway, many of the utilities can be categorized as minor (defined as those that can cheaply and/or easily be relocated or modified if necessary). These utilities include water lines less than 24 inches in diameter, distribution and small transmission power lines (69 kV and lower), localized storm drain networks, local communications facilities (telephone and cable television), and distribution natural gas pipelines. All of these types of facilities exist within the SR 801 Study Area, but they have largely been disregarded during the alternatives selection process because they would not have a material effect on the selection process.

By contrast, major utilities were identified and evaluated on a case-by-case basis. For the purposes of this study, major utilities include 230 kV and higher overhead transmission power lines, sanitary sewer pipelines and lift stations, regional storm drain pipes, channels and culverts, water pipes larger than 24 inches in diameter, national communications facilities (primarily fiber-optic routes), petroleum pipelines, and large irrigation district-owned facilities such as canals and culverts.

A listing of the major utilities and their owners is shown in Table 2.22.

**Table 2.22 – Major Utilities by Ownership**

Owner	Facilities
APS – Power	230 kV overhead power lines and two substations
APS – Palo Verde	104-inch to 114-inch diameter pipeline between 91st Avenue WWTP and Palo Verde Nuclear Generating Station (PVNGS)
SRP – Power	230 kV and 500 kV overhead power lines
SRP – Water	SRP Canal and SRP Buckeye Feeder Canal.
WAPA	230 kV overhead power lines
TEP	345 kV overhead power lines
BWCDD	Buckeye Canal and South Extension Canal
St. Johns Irrigation District	St. Johns Canal
Roosevelt Irrigation District	Outfall facility down Cotton Lane
Qwest	Fiber-optic facilities in the UPRR right-of-way
Sprint	Fiber-optic facilities in the UPRR right-of-way
XO Communications	Fiber-optic facilities in the UPRR right-of-way
Verizon Business	Fiber-optic facilities in the UPRR right-of-way and near Litchfield Road and Broadway Road
Level 3 Communications	Numerous fiber-optic facilities in the UPRR right-of-way
El Paso Natural Gas	20-inch diameter pipeline oriented northwest-southeast through the project between Avondale Boulevard and 103rd Avenue
Southwest Gas	8-inch high-pressure pipeline oriented northeast-southwest around Sarival Avenue

Owner	Facilities
Kinder Morgan Energy Partners	20-inch high pressure refined petroleum product pipeline in the UPRR right-of-way; also owns a 12-inch pipeline inside the UPRR right-of-way that is currently leased for fiber optic use by Level 3 (formerly WiTel)
City of Goodyear	Goodyear WWTP; 20-inch to 36-inch sanitary sewer and reclaimed water lines south of MC 85 oriented north-south ½ mile west of Estrella Parkway; planned 30-inch water line in Cotton Lane
City of Avondale	Avondale WWTP; 24-inch to 48-inch water, sewer, and reclaimed water lines south of Broadway Road oriented north-south in Dysart Road; 96-inch storm drain pipe down Litchfield Road outfalling to Agua Fria River north of Broadway
City of Phoenix	91st Avenue WWTP; 10-inch sewer force mains to 90-inch gravity sewer pipes feeding the 91st Avenue WWTP; sewer pipes located in 75th Avenue, 83rd Avenue, 87th Avenue, 91st Avenue, 107th Avenue, and Broadway Road; sewer lift stations at 107th Avenue and Broadway, 107th Avenue and Roeser, and 91st Avenue and Broadway; 12-inch to 54-inch water lines in 67th Avenue, Broadway Road, and 91st Avenue; 66-inch to 96-inch diameter storm drain pipe in 75th Avenue
Union Pacific Railroad	Single-track alignment running northeast-southwest on the west end of the project boundary; plans exist to double-track this corridor

During the alternative development process, all of these major utilities were considered. Whenever possible, avoidance was the preferred strategy. Because most of these facilities were at-grade or underground, most alternatives used an elevated freeway profile to avoid underground conflicts. However, the evaluation process did recognize the need for encasing those facilities that fell under large embankments. In addition, because the alternatives used elevated profiles, overhead power line relocations were addressed in the evaluation process.

### APS PVNGS Pipeline

This pipeline merits special attention. A coordination meeting was held with Palo Verde staff on July 12, 2006, to discuss potential impacts to this facility. Detailed meeting notes are available from this meeting. In summary, some quick facts about the pipeline follow:

- Facility is a large-diameter Portland Cement Concrete Pipe (96-inch to 114-inch) that runs from the City of Phoenix 91st Avenue WWTP to the PVNGS.
- Access manholes are located along the pipeline approximately every mile.
- The pipeline must be useable until at least 2045.
- The pipeline is the sole source of water for the plant. Losing the pipeline would mean shutting down the plant and blacking out a significant part of the southwest United States.
- On-site water storage at the PVNGS currently equates to approximately 10 days worth of water. Therefore, the PVNGS will allow a 10-day-long shutdown, typically in April and October, corresponding to the refueling periods for the reactors. However, APS will not allow any shutdowns

for the next 2 years because it is expanding and relining the on-site reservoirs during this time (this should not affect the SR 801 project). After this expansion project is completed, the on-site water storage capacity should expand to about 15 days.

- The pipeline is located on land that APS either owns in fee (about 80 percent of the pipeline) or on easements (about 20 percent of the pipeline) ranging in widths from 100 to 150 feet.
- The pipeline was originally encased under SR 85, MC 85, and the Agua Fria River. The pipeline siphons under the Agua Fria River.
- The minimum separation between the APS pipe and other facilities, such as utilities or pipelines, is 4 feet. A special analysis by APS would be needed to recommend the minimum separation between the APS pipe and the SR 801 freeway.
- APS would perform all design and construction activities for pipe encasements.
- APS has had some corrosion problems with the steel reinforcing in the pipe. APS performs rigorous and regularly scheduled inspections and maintenance on the pipe, typically reinforcing 15 to 20 spools of pipe per year with external reinforced encasement.
- APS has used three types of pipe reinforcing systems in the past:
  - *Internally Applied Carbon Fiber Coating* – This is a last resort application in areas where the pipeline just cannot be excavated and exposed (such as under a railroad track).
  - *Tendon and Shotcrete* – This entails excavating the pipe (in spool increments) during a dry up, wrapping the pipe with a spiral steel tendon and applying tension, shotcreting the entire facility, and then backfilling. A cathodic protection is also installed. This is routinely done as part of APS's annual maintenance program and APS is most familiar with this system. Costs range between \$80,000 and \$100,000 per spool of pipe (which corresponds to approximately \$4,500 per linear foot). This work goes very fast and APS officials were confident that up to 45 spools could be completed in a typical 10-day window.
  - *Reinforced Concrete Block* – This is used for heavy-duty applications and entails excavating the pipe, constructing a steel reinforcing cage around the pipe, forming around the cage, pouring cast-in-place concrete in the forms, and then backfilling. Minimum thickness of the concrete block around the pipe is 12 to 18 inches. APS has not routinely gone to this level of encasement; however, it does ensure the highest level of protection against pipe failure for that particular section. Cost for this type of reinforcing will vary by pipe size, depth, and groundwater depth, but is estimated at around \$7,000 per linear foot.

During this coordination meeting, APS went on record supporting either of the 2a subsections because these were the only two Section 2 options that would avoid pipeline impacts. APS is strongly opposed to any of the options that would necessitate a pipeline relocation.

### Overhead Power Lines

The SR 801 corridor has numerous high voltage overhead power lines (OHP) crossing in and out of the Study Area. Consequently, every alternative developed crossed an overhead power line. Recognizing this, the Study Team held a special meeting with three of the major power companies (SRP, WAPA, and TEP) on July 18, 2006. APS was not invited because the Study Team believed it did not have any facilities in the corridor at that time. However, at the July 18 meeting, the Study Team learned that APS has a 230 kV facility hanging off an SRP pole line.

During the meeting, the Study Team briefed the power companies on the potential overhead power line impacts and received feedback from each utility about costs, timeframes, and permits and clearances needed to perform relocations or adjustments. The following points summarize the discussions:

- Nothing is impossible: every one of the overhead power facilities identified can be relocated or adjusted. It is simply a matter of cost and planning.
- Major relocations would likely require a Certificate of Environmental Compliance (CEC). All of the power companies agreed that a CEC would likely be required for the adjustments being discussed. This adds cost and time (2 to 3 years) to any relocation plans.
- On similar ADOT projects in the past, the environmental document generated by ADOT for the roadwork often times can be used for the CEC, greatly decreasing the duration of this activity. Also, if the environmental documentation being prepared by ADOT does not completely satisfy the CEC requirements, then ADOT can direct the preparers to expand the scope of the environmental documentation to include the necessary aspects of the CEC.
- Regarding relocations versus heightening, if the overhead power lines conflict with the proposed freeway, then two options exist to solve the problem. The lines can be raised along their existing horizontal alignments or they can be relocated horizontally to avoid the conflict. Either method can be used; however, it was clear that the relocation method was preferred over the raising method. This would need to be evaluated on a case-by-case basis, but the added cost to raise the power lines often times is enough to purchase new right-of-way to relocate the lines. In addition, it is much safer to relocate lines than to raise in place.
- Because of the growth in the valley and the increase in loads these lines are experiencing, it is becoming increasingly difficult to get an outage for a relocation. In addition, the outage windows are becoming shorter. Generally speaking, outages could occur are between November and February. Actual outage windows would be based on multiple factors and would have to be determined by the utility owner.
- In a couple of locations, the various utility owners have lines that run parallel to other facilities. This is the case at the Bullard interchange location. Should multiple power lines need to be relocated or raised, then complex coordination would be required between the owners to do this work in a logical and safe sequence. Given the infrequent and short outages that could be available, it could take years to get multiple facilities moved.
- Several of the western potential conflict sites are very close to the Phoenix-Goodyear Airport. Pole adjustments near the airport may require additional FAA coordination.
- If the power lines that enter the Rudd Substation need to be modified, one should expect adjustments within the Rudd Substation. This would add cost and would require additional coordination. To keep these adjustments to a minimum, all proposed relocations should attempt to enter the substation in the same location and angle.
- For planning purposes, the power companies generally agreed with the following relocation costs:
  - \$1.5 million per mile plus right-of-way costs for 500 kV
  - \$1.0 million per mile plus right-of-way costs for 345 kV
  - \$1.0 million per mile plus right-of-way costs for 230 kV
  - \$750,000 per mile plus right-of-way costs for 69 kV
- Should relocations be chosen, then new right-of-way or easements would need to be acquired by ADOT for the new power line alignment. The widths of these new strips should be the same as the widths that the power companies currently hold.

- The Study Team asked each of the power companies if they had planned improvements on these potentially impacted facilities or if they had expansion plans along these alignments. TEP responded that it may add a second circuit (345 kV or 500 kV) within its right-of-way in the future, although it was not clear when. The others agreed to look into this.

**Major Utility Impacts**

The following table (Table 2.23) lists major impacts to utilities, by subsection.

**Table 2.23 – Major Utility Impacts, by Subsection**

Subsection	Impacts
1a	<ul style="list-style-type: none"> <li>➤ Numerous fiber-optic facilities within the UPRR right-of-way</li> <li>➤ Kinder Morgan pipelines within the UPRR right-of-way</li> <li>➤ Goodyear water and sewer lines associated with Goodyear WWTP</li> <li>➤ Southwest Gas pipeline encasement</li> </ul>
1b	<ul style="list-style-type: none"> <li>➤ Buckeye Canal crossing</li> <li>➤ APS PVNGS pipeline encasement at Buckeye Canal crossing</li> <li>➤ Southwest Gas pipeline encasement</li> <li>➤ Goodyear water and sewer lines associated with Goodyear WWTP</li> </ul>
2a-1 2a-2	<ul style="list-style-type: none"> <li>➤ Buckeye Feeder Canal at Avondale Boulevard</li> <li>➤ 500 kV (SRP) and 230 kV (APS) OHP relocation at El Mirage Road</li> <li>➤ 230 kV (WAPA) OHP at El Mirage Road</li> <li>➤ El Paso Natural Gas pipeline encasement east of Avondale Boulevard</li> </ul>
2b-1	<ul style="list-style-type: none"> <li>➤ Buckeye Feeder Canal at Avondale Boulevard</li> <li>➤ 500 kV (SRP) and 230 kV (APS) OHP relocation at Bullard Road</li> <li>➤ 230 kV (WAPA) OHP relocation at Bullard Road</li> <li>➤ 500 kV (SRP) OHP relocation at Bullard Road</li> <li>➤ 345 kV (TEP) OHP relocation at Bullard Road</li> <li>➤ El Paso Natural Gas pipeline encasement east of Avondale Boulevard</li> <li>➤ APS PVNGS pipeline encasement at Bullard Road</li> <li>➤ APS PVNGS pipeline encasement ½ mile east of El Mirage Road</li> </ul>
2b-2	<ul style="list-style-type: none"> <li>➤ Buckeye Feeder Canal at Avondale Boulevard</li> <li>➤ 500 kV (SRP) OHP relocation at El Mirage Road</li> <li>➤ El Paso Natural Gas pipeline encasement east of Avondale Boulevard</li> <li>➤ APS PVNGS pipeline encasement ½ mile east of Dysart Road</li> </ul>
2c-1	<ul style="list-style-type: none"> <li>➤ Buckeye Feeder Canal at Dysart Road</li> <li>➤ 500 kV (SRP) and 230 kV (APS) OHP relocation at Bullard Road</li> <li>➤ 230 kV (WAPA) OHP relocation at Bullard Road</li> <li>➤ 500 kV (SRP) OHP relocation at Bullard Road</li> <li>➤ 345 kV (TEP) OHP relocation at Bullard Road</li> <li>➤ 500 kV (SRP) OHP relocation at 99th Avenue</li> <li>➤ APS PVNGS pipeline encasement at Bullard Road</li> <li>➤ APS PVNGS pipeline encasement at 99th Avenue</li> <li>➤ El Paso Natural Gas pipeline encasement east of Avondale Boulevard</li> </ul>
2c-2	<ul style="list-style-type: none"> <li>➤ Buckeye Feeder Canal at Dysart Road</li> <li>➤ El Paso Natural Gas pipeline encasement at 107th Avenue</li> <li>➤ APS PVNGS pipeline encasement east of 107th Avenue</li> </ul>

2c-3	<ul style="list-style-type: none"> <li>➤ Buckeye Feeder Canal on east bank of Agua Fria River</li> <li>➤ El Paso Natural Gas pipeline encasement east of 107th Avenue</li> <li>➤ APS PVNGS pipeline encasement east of 99th Avenue</li> </ul>
3a	<ul style="list-style-type: none"> <li>➤ 69 kV (SRP) OHP relocation at Broadway Road</li> <li>➤ Numerous potential impacts with water and sewer in Broadway Road</li> <li>➤ Storm sewer pipeline at 75th Avenue</li> <li>➤ Large diameter water pipes in 67th Avenue</li> </ul>
3b	<ul style="list-style-type: none"> <li>➤ 69 kV (SRP) OHP relocation at 91st Avenue</li> <li>➤ 69 kV (SRP) OHP relocation at 83rd Avenue</li> </ul>

**2.10 Constructability**

Because SR 801 would be a new freeway corridor, constructability issues are relatively minor and would have negligible influence on the alternatives selection process. However, a few items that have been identified include:

- Bridge and light pole construction with cranes under overhead power lines
- Bridge and light pole construction with cranes under the airport runway approaches
- Traffic control issues at crossroads during bridge construction
- SR 303L is scheduled to be built before 2020 at the SR 801 connection. Traffic control issues on the SR 303L freeway may have to be addressed for the construction of the SR 801/SR 303L ramps.
- SR 202L is scheduled to be built before 2015 at the SR 801 connection. Traffic control issues on the SR 202L freeway would need to be addressed for the construction of the SR 801/SR 202L ramps.
- Because the SR 801/SR 202L interchange would be at least partially over the Salt River, constructability issues with the bridge in the river bottom would need to be addressed.
- Bridge construction would occur in the Agua Fria River.
- Typical coordination issues with overhead power line relocations and pipeline encasements
- Ideally, earthwork borrow sources should be identified and haul routes should be considered. Some bridges may warrant being designed for off-road haul trucks and/or scrapers.
- Work on and around the Tres Rios levee
- Environmental sensitivity to construction activities near the river habitat
- Construction activities that fall within old sand and gravel operation sites
- Project implementation issues such as interim end of freeway conditions and logical drainage outfalls

**2.11 Environmental Setting and Context**

This section lists a summary of the environmental findings related to the alternatives selection process. Each one of these topics will be discussed in greater detail in the Draft EA document. These topics document existing conditions within the Study Area and report analyses of potential impacts of the proposed SR 801 subsections. The potential environmental impacts described will be refined as the proposed SR 801 action alternatives are developed.

## Air Quality

The *Draft Air Quality Report* for SR 801 describes the existing air quality in the Study Area and reports the evaluation of the proposed freeway's potential air quality impacts.

The proposed SR 801 freeway would lie in an area designated as being in "nonattainment" of the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM<sub>10</sub>) and ozone (O<sub>3</sub>). It is also located in an attainment area with a maintenance plan for carbon monoxide (CO). The EPA sets the NAAQS as required by the Clean Air Act of 1970.

The nearest air quality monitoring sites to the Study Area are the West Phoenix site, located at 39th Avenue and Earll Drive, and the Buckeye site, located at SR 85 and MC 85. At these sites, local air quality is monitored and data are collected on concentrations of multiple pollutants. In 2005, both sites had exceedances of the PM<sub>10</sub> standard. All other concentrations monitored in 2005 at both sites were below the NAAQS.

Air quality analyses for proposed roadways focus on vehicle emissions of CO. Because of the scope of the project, five proposed service traffic interchanges for SR 801 were modeled to estimate future CO concentrations. The five interchanges were projected to have the highest traffic volumes and congestion and would likely produce the highest concentrations of pollutants. The analysis showed that the proposed SR 801 corridor alternatives would not cause or contribute to the severity or number of violations of the NAAQS. An analysis of mobile source air toxics (MSATs) for the SR 801 Study Area is pending.

## Biological Resources

The *Draft Biological Resources Report* for SR 801 describes existing conditions in the Study Area and potential impacts to plant communities and wildlife.

The SR 801 Study Area is located within the Lower Colorado River Valley subdivision of the Sonoran Desert, a region characterized by high temperatures and low precipitation for most of the year. The elevation ranges from approximately 875 to 1,016 feet above mean sea level.

Within the Study Area, the predominant plant community is mixed agricultural, which exists alongside expanding areas of residential and commercial development. Sonoran creosotebush scrub, xeroriparian, and riparian vegetation occur along the riverbeds of the Gila, Agua Fria, and Salt rivers. Earthen-banked irrigation canals and ditches located throughout the Study Area support scattered riparian and Sonoran creosotebush scrub vegetation. An 8.3-acre man-induced wetland has developed along the eastern bank of the Agua Fria River near the City of Avondale WWTP.

The majority of plant community acreage that would be affected by the proposed SR 801 corridor alternatives occurs in the mixed agricultural plant community, because this is the dominant community in the Study Area. Sonoran creosotebush scrub is the plant community with the next highest extent of affected acreage.

Wildlife in the Study Area varies according to land use and habitat type. Wildlife associated with flooded agricultural fields includes mainly wading birds, such as the great blue heron, snowy egret, and killdeer. Dry agricultural fields provide habitat for the American kestrel, red-tailed hawk, western burrowing owl, and various species of small mammals and reptiles. Within the remnant desertscrub and xeroriparian communities, Gambel's quail, coyote, and various species of small mammals and reptiles can be found. In the 8.3-acre man-induced wetland, the belted kingfisher, great blue heron, mallard duck, and various species of fish were observed by a qualified biologist.

According to the United States Fish and Wildlife Service's list of threatened and endangered species for Maricopa County, two endangered species (Yuma clapper rail and Southwestern willow flycatcher) and one

candidate species (Western yellow-billed cuckoo) have the potential to occur within the proposed SR 801 corridor alternatives. The analysis of the proposed corridor alternatives determined that the construction and operation of a transportation facility in any of the alternatives would not affect these three species and their habitat. No other listed species have the potential to occur in the proposed corridor alternatives because of the absence of suitable habitat.

Regarding Arizona wildlife of special concern, if the proposed SR 801 project were to progress, additional surveys would be needed to determine whether the black-bellied whistling duck or the least bittern occupy aquatic habitats within the Study Area.

## Cultural Resources

The *Class III Cultural Resources Survey of Proposed Alignments for the State Route (SR) 801 Freeway, SR 303L to SR 202L Report* for the proposed SR 801 corridor alternatives identified and recorded 11 archaeological sites and 7 linear historic sites.

All the prehistoric sites are associated with the Hohokam cultural tradition. The prehistoric sites included five villages, four artifact scatters, one historic artifact scatter, and one multicomponent artifact scatter. The village sites differed from the artifact scatters in that they were known to have historically documented surface features, such as platform mounds, ball courts, trash mounds, and/or compounds. Of the 11 prehistoric sites, the Cashion Site is listed in the National Register of Historic Places (NRHP). The Study Team recommended that an additional eight sites are eligible for listing in the NRHP for their potential to provide important information about the prehistoric Hohokam occupation and use of the lower Salt River and Buckeye valleys. Furthermore, the Study Team recommended that the two remaining sites are not eligible for the NRHP because of compromised integrity and a lack of information potential.

The historic linear sites included:

- Old US 80
- The Wellton-Phoenix-Eloy main line of the Southern Pacific Railroad (currently the UPRR)
- The Buckeye Canal
- The Roosevelt Canal
- The St. Johns Canal
- The South Extension Canal
- The Salt River Project Lateral 19.0

The Study Team recommended that all seven linear sites are eligible for the NRHP for their various associations with the early development of transportation and irrigation systems in the lower Salt River and Buckeye valleys. Furthermore, the Buckeye Canal and South Extension Canal are recommended as eligible for the NRHP because they are exceptional examples of nineteenth-century canal construction, technology, and engineering.

The architectural assessment of historic buildings and districts, which was performed as part of the Class III survey, identified 11 properties that are recommended as eligible to the NRHP within the context of rural, agricultural farmsteads and dairies in the lower Salt River and Buckeye valleys over the last 120 years. The properties include seven farmhouses, two dairies, and two farmsteads. The dairies and farmsteads are recommended as eligible for the NRHP as examples of historic-period agricultural facilities. The seven farmhouses are recommended as eligible for the NRHP because of their architectural merit.

## Floodplains

The *Draft Floodplain Report* for SR 801 identifies floodplains and floodways within the Study Area using the Federal Emergency Management Agency's Flood Insurance Rate Maps and describes potential impacts of the SR 801 corridor alternatives.

The primary floodway and floodplain features within the SR 801 Study Area are associated with the Gila, Salt, and Agua Fria rivers. In the western half of the Study Area, the northern bank of the Gila River borders the southern boundary of the Study Area. In the eastern half of the Study Area, the Salt River both crosses and forms the southern boundary of the Study Area. The Agua Fria River bisects the western portion of the Study Area approximately 3 miles downstream from the confluence of the Salt and Gila rivers. Existing land use within the 100-year floodplain can be categorized as mostly agricultural, with some residential development. Natural areas still exist along the southern boundary of the Study Area and directly adjacent to the rivers.

Within the Study Area, the 100-year floodplain of the Salt River has a maximum width of 4,100 feet, most of which is contained within the floodway. The 100-year floodplain of the Gila River has a maximum width of 9,400 feet, which extends well beyond its floodway into the central portion of the Study Area. The 100-year floodplain of the Agua Fria River is primarily contained within its floodway, except at the confluence with the Gila River, where it extends approximately 4,700 feet to the west of the floodway banks. In the western portion of the Study Area, a 100-year floodplain is located between MC 85 and the Buckeye Irrigation Canal. This floodplain extends from approximately Bullard Avenue to Cotton Lane and is separated from the Gila River floodplain by the Buckeye Irrigation Canal.

Under the proposed corridor alternatives for SR 801, Subsections 1b, 2c, and 3b would have the greatest impacts to the 100-year floodplain in their respective sections. Subsections 1a, 2b, and 3a would have the least impact on the 100-year floodplain within their respective sections because they are generally the farthest away from the Salt and Gila rivers.

The United States Army Corps of Engineers and the City of Phoenix constructed a levee along the northern banks of the Salt and Gila rivers. The levee extends from approximately 105th Avenue west to the Agua Fria River. The levee is expected to remove land to the north from the 100-year floodplain, which would dramatically decrease 100-year floodplain impacts of the SR 801 corridor alternatives within Section 2.

## Hazardous Materials

A *Draft Preliminary Initial Site Assessment* was completed to identify hazardous material sites within the SR 801 Study Area. Through a combination of environmental database research and field reconnaissance, 31 hazardous material sites were identified within the Study Area. Of those 31 sites, 21 sites have a high-to-moderate risk level regarding hazardous materials issues. The remaining 10 sites are considered low-risk sites, including some that have been remediated to the satisfaction of the ADEQ. At the subsection level, impacts to these sites are listed in Table 2.24

**Table 2.24 – Hazardous Material Site Impacts, by Subsection**

Subsection	Impacts
1a	4 low-risk sites
1b	1 low-risk site
2a-1, 2a-2	2 low-risk sites
2b-1, 2b-2	No impacts
2c-1, 2c-2, 2c-3	2 high-risk sites

3a	1 high-risk site
3b	1 low-risk site

## Jurisdictional Waters

The *Draft Jurisdictional Waters Report* describes the extent of waters of the United States in Sections 1, 2, and 3 of the SR 801 Study Area and presents preliminary estimates of acreage that would be affected by the proposed SR 801 corridor alternatives.

The primary water of the United States in Section 1 is the Buckeye Irrigation Canal (BIC), which flows westward through Section 1. The BIC measures 40 feet wide and is earthen-lined. Flowing southwest through agricultural fields from the BIC is the South Extension Canal, which has a channel width of 5 feet. An unnamed canal flows south from the BIC and discharges irrigation return flows into the Gila River; it is earthen-lined with a channel width of 5 feet.

Within Section 2 of the Study Area, the Agua Fria River flows north to south. The delineated portion of the Agua Fria River ranges in width from 42 to 253 feet. Also in Section 2, the BIC begins at the Gila River at the mouth of the Agua Fria River and flows west through agricultural land. The Buckeye Feeder canal, with a channel width of 10 feet, begins in the northern part of Section 2 near Avondale Boulevard and flows south until it turns west. Terminating at the Buckeye Feeder canal, the St. Johns Canal flows west from 91st Avenue through agricultural fields. It is concrete-lined and has a channel width of 2 feet. In the western portion of Section 2, Bullard Wash flows north to south through the Study Area; it is both earthen-banked and gabion-lined, with a width of approximately 121 feet.

Two man-induced wetlands were identified along the Agua Fria River in Section 2. On the river's west edge, a wetland formed as a result of a gravel mining operation; a pit has developed into a wetland approximately 0.2 acre in size. On the river's east edge, discharge from the City of Avondale WWTP has created an 8.3-acre wetland.

In the eastern portion of Section 3, the Salt River flows northeast to southwest. The river has channel widths varying from approximately 1,584 to 3,168 feet. Discharging tailwater into the Salt River near 67th Avenue is an unnamed SRP pump ditch that is earthen-lined with a channel width of 4 feet. Also discharging into the Salt River at 83rd Avenue is an unnamed, concrete-lined canal with a channel width of 3 feet.

**Table 2.25 – Jurisdictional Waters Acreage, by Subsection**

Subsection	Acres
1a	0
1b	2
2a-1, 2a-2	4
2b-1, 2b-2	6
2c-1, 2c-2	7
2c-3	4
3a	17
3b	22

## Noise

The *Draft Noise Report* for SR 801 includes documentation of existing noise levels in the Study Area and the results of modeling to determine future noise levels along the proposed corridor alternatives.

Noise level readings were taken at 15 monitoring sites within the Study Area to document existing noise levels, which ranged from a low of 40 dBA  $L_{Aeq1h}$  to a high of 54 dBA  $L_{Aeq1h}$ . There were no dominant noise sources at any of the monitoring sites because much of the area is sparsely developed. Background noises consisted of occasional aircraft, traffic at some sites, birds, and agricultural noises at some sites.

Future noise levels were evaluated for 271 receivers located along the proposed SR 801 corridor alternatives, using the TNM 2.5 noise prediction computer model. This evaluation used projected peak-hour traffic volumes for 2030, assuming that the SR 801 freeway would be built. The projected future noise levels were compared with ADOT's *Noise Abatement Policy (2005)* to determine which receivers would be eligible for consideration of mitigation measures.

**Table 2.26 – Noise Receivers Eligible for Mitigation, by Subsection**

Subsection	Receiver sites
1a	0
1b	0
2a-1, 2a-2	15
2b-1, 2b-2	18
2c-1, 2c-2, 2c-3	25
3a	11
3b	10

## Prime and Unique Farmlands

The *Draft Prime and Unique Farmland Report* for SR 801 documents the amount of agricultural land in the Study Area and identifies potential prime and unique farmland that would fall under the Farmland Protection Policy Act regulations.

Existing land use in the Study Area is primarily agricultural and residential, with additional limited areas of open space and institutional and commercial uses. Prime and unique farmland accounts for nearly 15,777 acres, or approximately 70 percent of the total Study Area's 22,339 acres. By 2020, future land use in the Study Area is projected to be primarily residential, with some commercial development at key intersections. Approximately 36 percent of the land in the SR 801 Study Area is either developed or in the development process and is now or soon will no longer be farmable.

All the proposed SR 801 corridor alternatives would directly affect prime and unique farmland. Subsections 1b, 2c, and 3b would affect the most agricultural land within their respective sections. All the subsections would bisect existing farmland. The introduction of a freeway may also create remnants too small to farm efficiently and economically. However, because of the urban growth of the Phoenix metropolitan area, it is likely that farmland in the Study Area would eventually be lost through conversion to urban uses with or without the SR 801 freeway.

## Section 4(f) and Section 6(f) Resources

A *Draft Section 4(f) and Section 6(f) Report* documents resources within the SR 801 Study Area that are protected under the Department of Transportation Act of 1966, as amended. The Act stipulates that the

Secretary of Transportation cannot approve the use of land from a significant publicly owned public park, recreation area, wildlife or waterfowl refuge, or significant cultural resource unless there is no prudent and feasible alternative to the use of that land and unless the action includes all possible planning to minimize harm to the property resulting from its use.

Thirty-one Section 4(f) resources were identified within one-quarter mile of the proposed SR 801 corridor alternatives; they consist of trails, historic properties, and current and future parks. Nine of these resources would be directly affected by the proposed SR 801 corridor alternatives.

A Section 6(f) evaluation was also conducted to comply with the Land and Water Conservation Fund Act, which was passed by Congress in 1965 and established the Land and Water Conservation Fund, a financial assistance matching program providing grants paying half the acquisition and development cost of outdoor recreation sites and facilities. Section 6(f) of the act prohibits the conversion of property acquired or developed with these grants to a nonrecreational purpose without the approval of the U.S. Department of the Interior's National Park Service. There are no Section 6(f) resources in the SR 801 Study Area.

## Socioeconomics

The *Draft Socioeconomic Report* for SR 801 identifies existing and future land use, potential residential and business displacements, population characteristics, and potential economic impacts.

The Study Area falls entirely within Maricopa County and includes portions of the municipalities of Avondale, Buckeye, Goodyear, and Phoenix. Additional land in the Study Area is unincorporated and under the jurisdiction of Maricopa County. The Study Area is primarily characterized by agricultural land and residential land, which make up 61 percent and 17 percent of the Study Area, respectively. By 2030, it is anticipated that more than two-thirds of the Study Area land (69 percent) would be developed into residential uses. Another 17 percent is anticipated to be developed as employment uses (commercial, industrial, and mixed use), and the remaining 14 percent is planned for open space and public/quasi-public uses. Currently, the Study Area contains 47 planned residential and commercial developments covering approximately 9,562 acres. These projects are in various stages of development, from formal planning to construction. Table 2.27 summarizes the displacements of both existing and platted residences.

**Table 2.27 – Residential Displacements (Built and Platted), by Subsection**

Subsection	Built	Platted
1a	1	0
1b	1	0
2a-1, 2a-2	22	366
2b-1, 2b-2	14	181
2c-1, 2c-2, 2c-3	208	16
3a	855	323
3b	67	0

The Study Area population in 2005 was approximately 17,640. By 2025, the population within the Study Area is expected to reach 146,122. A projection of future employment shows that 48,592 jobs would exist in the Study Area by 2025.

The SR 801 Study Area is characterized by a greater percentage of minority populations and persons living below the poverty level than the corresponding percentage in Maricopa County as a whole. The percentage of minorities in the Study Area is approximately two-thirds higher than that of the county



population. Percentages of disabled, elderly, and female head of household populations within the Study Area are comparable to or lower than those of the county.

All of the proposed SR 801 corridor alternatives would adversely affect minority and low-income populations (protected by Title VI of the Civil Rights Act of 1964 and the Executive Order on Environmental Justice), but impacts would not be disproportionately high after comparing the impacts and benefits to all populations in the Study Area. An analysis of the proposed project demonstrates that the benefits of SR 801, such as the improved regional mobility and reduced local arterial street traffic, would accrue to both environmental justice and nonenvironmental justice communities. Additionally, low-income and minority populations would not be disproportionately affected and would be beneficiaries of the proposed transportation improvements.

In 2000, there were 60 employers in the SR 801 Study Area, employing 1,820 people. Most industries are located north of Broadway Road and in the northern portion of the Study Area. The largest industry in the Study Area is the agriculture, forestry, and fisheries industry, representing 23 percent of all industries. The manufacturing industry, with more than 800 employees, has the most employees. Table 2.28 summarizes the impacts to businesses by subsection, most of which are dairy operations.

**Table 2.28 – Affected Businesses, by Subsection**

Subsection	Affected businesses
1a	0
1b	0
2a-1, 2a-2	1
2b-1, 2b-2	1
2c-1, 2c-2, 2c-3	1
3a	6
3b	3

Property tax impacts related to the proposed corridor alternatives would range from virtually no impact, as in Phoenix, to an approximately 5.8 percent reduction of annual property tax revenues in Avondale because of Subsection 2c. Projected and planned future development, along with freeway-related development that would occur after the completion of SR 801, would likely offset any property tax impacts experienced by the Study Area jurisdictions.

Sales tax revenue in the Study Area is generated from commercial and industrial land uses. Sales tax revenue impacts related to the proposed corridor alternatives would be the greatest in Goodyear and Avondale. Potential annual sales tax revenue reductions in Goodyear would be 1.9 percent under Subsection 1a. In Avondale, potential annual sales tax revenue reductions would be 6.6 percent under Subsection 2c. As with the property tax impacts, projected and planned future development, along with freeway-related development that would occur after the completion of SR 801, would likely offset any sales tax impacts experienced by the Study Area jurisdictions. In addition, sales tax revenue collected during construction would also help offset the revenue impacts.

### Transit

The *Draft Transit Modal Analysis* for SR 801 identifies existing and programmed transit service in the Study Area.

Existing transit service in the Phoenix metropolitan area is characterized by fixed-route bus service operating on the arterial street network and freeways. Multiple service providers that operate under the

name “Valley Metro” fund fixed-route transit service in the region. The region differs from most other metropolitan areas in that transit service is funded by a combination of city and regional funds and varies significantly from city to city.

Existing transit service in the SR 801 Study Area is limited, because there is little existing transit service in the corridor and very few transit improvements identified in the MAG’s 2003 RTP. Existing fixed-route bus service in the SR 801 Study Area includes three local bus routes and one express bus route.

Paratransit service in the SR 801 Study Area is provided by the Southwest Valley Americans with Disabilities Act (ADA) Service and the Maricopa County Human Services Special Transportation Services (STS). ADA requires that complementary paratransit service be provided in all areas within three-fourths of a mile of fixed-route transit service. Maricopa County Human Services STS provides door-to-door services to seniors, the disabled and low-income individuals throughout Maricopa County.

Programmed transit service in the SR 801 Study Area includes transit improvements listed in the RTP. However, these transit improvements are extremely minor and limited to the extension of local bus service and the addition of bus rapid transit and express bus service on the perimeter of the Study Area.

### Visual Resources

The *Draft Visual Assessment Report* for SR 801 documents the existing landscape characteristics of the Study Area and potential impacts of the proposed corridor alternatives.

Characteristic landscape components within and surrounding the SR 801 Study Area include the Agua Fria, Gila, and Salt rivers. A number of canals and irrigation channels are located throughout the Study Area. The visual character of the Study Area is also affected by the White Tank Mountains to the northwest, the Sierra Estrella to the southwest, and the South Mountain range to the southeast.

The entire Study Area environment is transitioning from a rural character to a more populated, suburban character. This would have a substantial and increasing impact on the Study Area’s future visual context. As a whole, the Study Area landscape is relatively level, with a slight sloping to the southwest. This environment has a rural visual character interspersed with established and emerging community settlement patterns. Section 1 has a primarily rural character, while Sections 2 and 3 have a more developed, urban character.

Within Section 1, Subsection 1a and 1b would affect the landscape’s visual character primarily through their displacement of any remaining rural agricultural lands. Some proposed open spaces would also be disrupted. Subsection 1a would have less visual impact on the landscape character than would Subsection 1b, mainly because of its proposed location. Subsection 1a would be located through the middle of Section 1 at a distance from the river and mountains, whereas Subsection 1b is proposed to be located adjacent to the Gila River, on the southern perimeter of the Study Area, much closer to the mountains.

Within Section 2, Subsection 2a would have the least impact on the visual character and visual quality in this section. Subsection 2a would be farther away from the mountain and river landscapes; therefore, it would not have as substantial an impact on those positive visual elements as would the other two alternatives. Subsection 2a would not displace as many of the remaining rural residents whose properties provide views of the mountains and rivers. Subsection 2b would be preferable to Subsection 2c for the same reasons. Subsection 2c would create a visual barrier to the mountain and river landscapes.

Within Section 3, the impact of both Subsections 3a and 3b on visual quality of the landscape would be roughly equal. Both of the proposed subsections would affect residential development. Subsection 3b

would have less of an impact on visual resources than Subsection 3a because it would displace less residential development.

### Water Resources

The *Draft Water Resources Report* for SR 801 discusses surface water features, groundwater quality, groundwater wells, and irrigation infrastructure within the Study Area.

The Salt, Gila, and Agua Fria rivers are the major surface water resources in the Study Area. The Salt River, which is located on the southern border of the Study Area, flows into the Gila River near Avondale Boulevard. The Agua Fria River flows from north to south in the Study Area, converging with the Gila River near Litchfield Road. Flow in the Salt, Gila and Agua Fria rivers is seasonal and intermittent.

Three WWTPs discharge water within the Study Area. The 91st Avenue WWTP discharges treated effluent to the Salt River near 91st Avenue. The City of Avondale WWTP discharges treated effluent near the confluence of the Agua Fria and Gila rivers. The City of Goodyear WWTP is located just north of the Buckeye Irrigation Canal and west of Estrella Parkway and discharges to the ground under permit.

Depth to groundwater varies throughout the Study Area (between 20 and 49 feet below ground surface) and varies over time because of fluctuations in annual precipitation. Groundwater quality in the Study Area generally satisfies existing EPA standards for drinking water, although the EPA nonenforceable secondary maximum contaminant level for nitrate and dissolved solids is exceeded. The “West Van Buren” State Superfund Site extends east-west underneath the eastern portion of the Study Area between Van Buren and Buckeye roads. This site is regulated by ADEQ, and water quality in several of the groundwater well locations exceeds standards for volatile organic compounds. In addition, the Phoenix-Goodyear Airport federal Superfund site is located roughly under the Phoenix-Goodyear Airport adjacent to the Study Area. The groundwater contaminants of concern include trichloroethene (TCE) and chromium. There are two contamination plumes within this site. Groundwater extraction and treatment of these two plumes using granular activated carbon began in 1994 and concluded in 1998. The plume is considered stable using injection wells and is monitored on a regular basis using 98 monitoring wells.

The corridor alternatives in all three sections of the Study Area could affect existing wells located within the right-of-way. A field well verification would need to be conducted prior to construction of any action alternative. Table 2.29 summarizes the well impacts by subsection based on an ADWR database.

**Table 2.29 – Affected Wells, by Subsection**

Subsection	Affected wells
1a	5
1b	48
2a-1, 2a-2	24
2b-1, 2b-2	28
2c-1, 2c-2, 2c-3	82
3a	32
3b	16

The proposed SR 801 corridor alternatives could also affect canal, ditch, and pipeline infrastructure belonging to the Roosevelt Irrigation District, the BWCCD, SRP, and the St. Johns Irrigation District.

### Environmental Resources

- Arizona Department of Transportation. 2007. *Draft Biological Resources Report, State Route (SR) 801: SR 303L to SR 202L*. Prepared by HDR Engineering, Inc. Phoenix.
- Arizona Department of Transportation. 2007. *Draft Section 4(f) and Section 6(f) Report, State Route (SR) 801: SR 303L to SR 202L*. Prepared by HDR Engineering, Inc. Phoenix.
- Arizona Department of Transportation. 2007. *Draft Socioeconomic Report, State Route (SR) 801: SR 303L to SR 202L*. Prepared by HDR Engineering, Inc. Phoenix.
- Arizona Department of Transportation. 2006. *Draft Air Quality Report, State Route (SR) 801: SR 303L to SR 202L*. Prepared by HDR Engineering, Inc. Phoenix.
- Arizona Department of Transportation. 2006. *A Class III Cultural Resources Survey of Proposed Alignments for the State Route (SR) 801 Freeway, SR 303L to SR 202L, Maricopa County, Arizona*. Prepared by HDR Engineering, Inc. Phoenix.
- Arizona Department of Transportation. 2006. *Draft Floodplain Report, State Route (SR) 801: SR 303L to SR 202L*. Prepared by HDR Engineering, Inc. Phoenix.
- Arizona Department of Transportation. 2006. *Draft Preliminary Initial Site Assessment, State Route (SR) 801: SR 303L to SR 202L*. Prepared by HDR Engineering, Inc. Phoenix.
- Arizona Department of Transportation. 2006. *Draft Jurisdictional Waters Report, State Route (SR) 801: SR 303L to SR 202L*. Prepared by HDR Engineering, Inc. Phoenix.
- Arizona Department of Transportation. 2006. *Draft Noise Report, State Route (SR) 801: SR 303L to SR 202L*. Prepared by HDR Engineering, Inc. Phoenix.
- Arizona Department of Transportation. 2006. *Draft Prime and Unique Farmland Report, State Route (SR) 801: SR 303L to SR 202L*. Prepared by HDR Engineering, Inc. Phoenix.
- Arizona Department of Transportation. 2006. *Draft Transit Modal Analysis, State Route (SR) 801: SR 303L to SR 202L*. Prepared by HDR Engineering, Inc. Phoenix.
- Arizona Department of Transportation. 2006. *Draft Visual Assessment Report, State Route (SR) 801: SR 303L to SR 202L*. Prepared by HDR Engineering, Inc. Phoenix.
- Arizona Department of Transportation. 2006. *Draft Water Resources Report, State Route (SR) 801: SR 303L to SR 202L*. Prepared by HDR Engineering, Inc. Phoenix.
- Arizona Department of Transportation. 2005. *Noise Abatement Policy*. Prepared by Environmental and Enhancement Group. Phoenix.
- Maricopa Association of Governments. 2003. *Regional Transportation Plan*. Phoenix.

### 2.12 Coordination

Because the Study Area’s character is constantly changing, coordination with other planning activities has been continuous and dynamic. Some of this coordination has already been discussed in previous sections for MAG traffic planning, the airport expansion plans, and utilities. Other coordination activities have also occurred. They are summarized below.

#### Municipal Coordination

The Study Area crosses the city boundaries of Goodyear, Avondale, and Phoenix. Their general plans were reviewed in conjunction with this study and most were developing or considering general plan updates or amendments during the SR 801 study. Because the general plans are constantly changing, links are provided below for each of the three municipalities:

- Goodyear General Plan  
<http://www.goodyearaz.gov/index.asp?NID=490>
- Avondale General Plan  
<http://www.ci.avondale.az.us/index.asp?NID=729>
- Phoenix General Plan  
<http://phoenix.gov/PLANNING/gpindex.html>

- Phoenix Avenida Rio Salado

Three of the cities have a WWTP within the Study Area. These plants represent real physical constraints to the SR 801 freeway. The Study Team worked with each of the cities and identified not only the existing WWTP boundary, but also the build-out boundary requirements. The SR 801 study used the build-out boundaries as the constraint limits. These boundaries are shown in Figure 2.12. It should be noted that while working with both Phoenix and Goodyear, both cities responded favorably the idea of having the proposed SR 801 right-of-way line share the build-out boundary line with their respective WWTPs. They felt the freeway would be a good development buffer (for both visual and odor issues) for the WWTP. The SR 801 Study Team considered this when developing the alternatives.

In addition to the general plans, other relevant city planning documents were reviewed and include:

- Avondale Transportation Plan  
<http://www.ci.avondale.az.us/index.asp?NID=653>
- Avondale Tres Rios Greenway Plan  
<http://www.ci.avondale.az.us/index.asp?NID=730>

Figure 2.12 – Wastewater Treatment Plant Boundaries



## Flood Control Studies and Projects

As mentioned previously, numerous flood control planning documents have been developed for the Study Area. Some are undergoing updates as of the writing of this report. In addition, a few flood control projects are underway. Links to these studies and projects are listed below:

- Tres Rios Wetlands (City of Phoenix, U.S. Army Corps of Engineers, and FCDMC)  
<http://phoenix.gov/TRESRIOS/index.html>  
<http://www.fcd.maricopa.gov/Neighborhood/ProjectDetails.asp?wPROJECT=71>
- El Rio Watercourse Master Plan (FCDMC)  
<http://www.fcd.maricopa.gov/projects/ElRio/>
- Rio Salado Oeste (City of Phoenix and the U.S. Army Corps of Engineers)  
[http://www.spl.usace.army.mil/cms/index.php?option=com\\_content&task=view&id=84&Itemid=31](http://www.spl.usace.army.mil/cms/index.php?option=com_content&task=view&id=84&Itemid=31)
- SR 303L Corridor/White Tanks Area Drainage Master Plan (FCDMC)  
<http://www.fcd.maricopa.gov/Neighborhood/ProjectDetails.asp?wPROJECT=34>
- Durango Area Drainage Master Plan (FCDMC)  
<http://www.fcd.maricopa.gov/Projects/DurangoADMP/>
- Durango Regional Conveyance Channel (DRCC) and Detention Basins – Phase 1 (FCDMC)  
<http://www.fcd.maricopa.gov/Neighborhood/ProjectDetails.asp?wPROJECT=125>
- Durango Regional Outfall Project (FCDMC)  
<http://www.fcd.maricopa.gov/Neighborhood/ProjectDetails.asp?wPROJECT=36>
- Bullard Wash Channel Improvement (FCDMC)  
<http://www.fcd.maricopa.gov/Neighborhood/ProjectDetails.asp?wPROJECT=9>

## Other Transportation Studies and Projects

In addition to the municipal planning activities, other regional transportation planning activities and construction projects have occurred or were occurring during the study phase. Links to these studies and projects are listed below:

- SR 202L South Mountain Corridor Study Project Site (ADOT)  
<http://www.dot.state.az.us/Roads/SouthMtn/index.htm>
- SR 303L, south of I-10 project site (ADOT)  
[http://www.dot.state.az.us/Highways/valley\\_freeways/Loop\\_303/South/index.asp](http://www.dot.state.az.us/Highways/valley_freeways/Loop_303/South/index.asp)
- Interstate 10 – Hassayampa Valley Roadway Framework Study (MAG)  
<http://www.mag.maricopa.gov/project.cms?item=6125>
- Final Design Concept Report – SR 303L, MC 85 to Indian School Road  
[http://www.rightroads.org/sr303L/docs/manuals/MC85-IndianSchRd\\_DCR.pdf](http://www.rightroads.org/sr303L/docs/manuals/MC85-IndianSchRd_DCR.pdf)
- Corridor Improvement Study – SR 303L, Riggs Road to MC 85  
[http://www.rightroads.org/sr303L/docs/manuals/Corridor\\_RiggsRd-MC85\\_3-2-04.pdf](http://www.rightroads.org/sr303L/docs/manuals/Corridor_RiggsRd-MC85_3-2-04.pdf)
- Final Design Concept Report – SR 303L, MC 85 to Indian School Road  
[http://www.rightroads.org/sr303L/docs/manuals/MC85-IndianSchRd\\_DCR.pdf](http://www.rightroads.org/sr303L/docs/manuals/MC85-IndianSchRd_DCR.pdf)
- MC 85 (75th Avenue to Turner Road) – Access Control and Corridor Improvement Study – Volumes 1 and 2  
[http://www.mcdot.maricopa.gov/manuals/eng\\_manuals/8343-01-0001.pdf](http://www.mcdot.maricopa.gov/manuals/eng_manuals/8343-01-0001.pdf)  
[http://www.mcdot.maricopa.gov/manuals/eng\\_manuals/8343-01-0002.pdf](http://www.mcdot.maricopa.gov/manuals/eng_manuals/8343-01-0002.pdf)

- Commuter Rail Strategic Plan (MAG)  
<http://www.mag.maricopa.gov/rfp.cms?item=6244>
- Cotton Lane, Estrella Parkway to MC 85 Project Update  
<http://www.rightroads.org/projects/2006/CottonLane.pdf>

## Private Development

The most dynamic changes in the Study Area are the rapid transformation of vacant, agricultural, and dairy properties into developed properties. Most of this new development is bringing new residential neighborhoods with densities of four to six homes per acre. This is true in most of the Phoenix, Avondale, and unincorporated Maricopa County portions of the Study Area (east of the Agua Fria River). In Goodyear, the planned development is a mix of residential and industrial/commercial, consistent with Goodyear's *General Plan* land use designations. Generally, the industrial/commercial uses surround the Phoenix-Goodyear Airport, while the residential properties begin to reappear near the western edge of the Study Area.

The Study Team has met with numerous developers and landowners within the Study Area over the course of the study. Planned development data has been collected and incorporated into the impact analysis. Figures 3.2 to 3.12 graphically show the latest development information collected at the time of the publication of this report.

## 2.13 Construction Cost Estimates

For the purposes of comparing alternatives, construction cost estimates were completed for each of the subsection alternatives developed. Major items of work that were estimated include:

- Earthwork
- Base and surface treatment
- Drainage
- Structures
- Traffic
- Roadside development
- Incidentals
- Utility relocations (identified in other project costs)

A 20 percent contingency was applied to the estimate for unidentified items and a 14 percent factor was applied for construction engineering and contingency. Detailed cost estimate summaries are included in Appendix E. An overview summary of each subsection is included in Table 2.30.

**Table 2.30 – Overview Cost Summary, by Subsection**

Construction activity	Subsection 1a	Subsection 1b	Subsection 2a-1	Subsection 2a-2	Subsection 2b-1	Subsection 2b-2	Subsection 2c-1	Subsection 2c-2	Subsection 2c-3	Subsection 3a	Subsection 3b
Earthwork	\$13,673,000	\$11,853,000	\$31,314,000	\$29,929,000	\$29,052,000	\$31,233,000	\$35,075,000	\$35,706,000	\$38,838,000	\$36,881,000	\$34,517,000
Base and surfacing	\$20,191,000	\$26,495,000	\$69,353,000	\$69,464,000	\$65,816,000	\$66,229,000	\$67,207,000	\$68,456,000	\$69,662,000	\$87,330,000	\$86,327,000
Drainage	\$11,080,000	\$11,097,000	\$21,679,000	\$21,872,000	\$23,495,000	\$23,186,000	\$22,056,000	\$22,385,000	\$22,948,000	\$18,061,000	\$18,849,000
Structures	\$44,986,000	\$14,771,000	\$86,531,000	\$86,531,000	\$173,576,000	\$156,077,000	\$185,866,000	\$182,631,000	\$122,485,000	\$131,499,000	\$121,619,000
Traffic	\$3,696,000	\$3,890,000	\$11,356,000	\$11,356,000	\$11,455,000	\$11,455,000	\$11,949,000	\$12,048,000	\$11,645,000	\$10,582,000	\$10,186,000
Roadside	\$6,596,000	\$7,541,000	\$22,202,000	\$23,601,000	\$22,227,000	\$22,232,000	\$24,047,000	\$25,141,000	\$23,167,000	\$10,878,000	\$9,762,000
Incidentals	\$17,109,000	\$12,985,000	\$55,559,000	\$51,051,000	\$69,965,000	\$60,582,000	\$75,021,000	\$77,349,000	\$61,501,000	\$52,355,000	\$50,173,000
<b>Subtotal A</b>	<b>\$117,331,000</b>	<b>\$88,632,000</b>	<b>\$297,994,000</b>	<b>\$293,804,000</b>	<b>\$395,586,000</b>	<b>\$370,994,000</b>	<b>\$421,221,000</b>	<b>\$423,716,000</b>	<b>\$350,246,000</b>	<b>\$347,586,000</b>	<b>\$331,433,000</b>
Unidentified (20 percent)	\$23,466,200	\$17,726,400	\$59,598,800	\$58,760,800	\$79,117,200	\$74,198,800	\$84,244,200	\$84,743,200	\$70,049,200	\$69,517,200	\$66,286,600
<b>Subtotal B</b>	<b>\$140,797,200</b>	<b>\$106,358,400</b>	<b>\$357,592,800</b>	<b>\$352,564,800</b>	<b>\$474,703,200</b>	<b>\$445,192,800</b>	<b>\$505,465,200</b>	<b>\$508,459,200</b>	<b>\$420,295,200</b>	<b>\$417,103,200</b>	<b>\$397,719,600</b>
Construction engineering (9 percent)	\$12,671,748	\$9,572,256	\$32,183,352	\$31,730,832	\$42,723,288	\$40,067,352	\$45,491,868	\$45,761,328	\$37,826,568	\$37,539,288	\$35,794,764
<b>Total construction costs</b>	<b>\$153,468,948</b>	<b>\$115,930,656</b>	<b>\$389,776,152</b>	<b>\$384,295,632</b>	<b>\$517,426,488</b>	<b>\$485,260,152</b>	<b>\$550,957,068</b>	<b>\$554,220,528</b>	<b>\$458,121,768</b>	<b>\$454,642,488</b>	<b>\$433,514,364</b>
Other project costs	\$600,000	\$2,600,000	\$3,300,000	\$3,300,000	\$21,700,000	\$9,500,000	\$24,350,000	\$3,150,000	\$3,900,000	\$300,000	\$300,000
Construction contingency (5 percent)	\$7,039,860	\$5,317,920	\$17,879,640	\$17,628,240	\$23,735,160	\$22,259,640	\$25,273,260	\$25,422,960	\$21,014,760	\$20,855,160	\$19,885,980
Design (10 percent of subtotal B)	\$14,079,720	\$10,635,840	\$35,759,280	\$35,256,480	\$47,470,320	\$44,519,280	\$50,546,520	\$50,845,920	\$42,029,520	\$41,710,320	\$39,771,960
<b>Total Construction Cost</b>	<b>\$175,188,528</b>	<b>\$134,484,416</b>	<b>\$446,715,072</b>	<b>\$440,480,352</b>	<b>\$610,331,968</b>	<b>\$561,539,072</b>	<b>\$651,126,848</b>	<b>\$633,639,408</b>	<b>\$525,066,048</b>	<b>\$517,507,968</b>	<b>\$493,472,304</b>

## **3.0 Design Concept Alternatives and Evaluation**

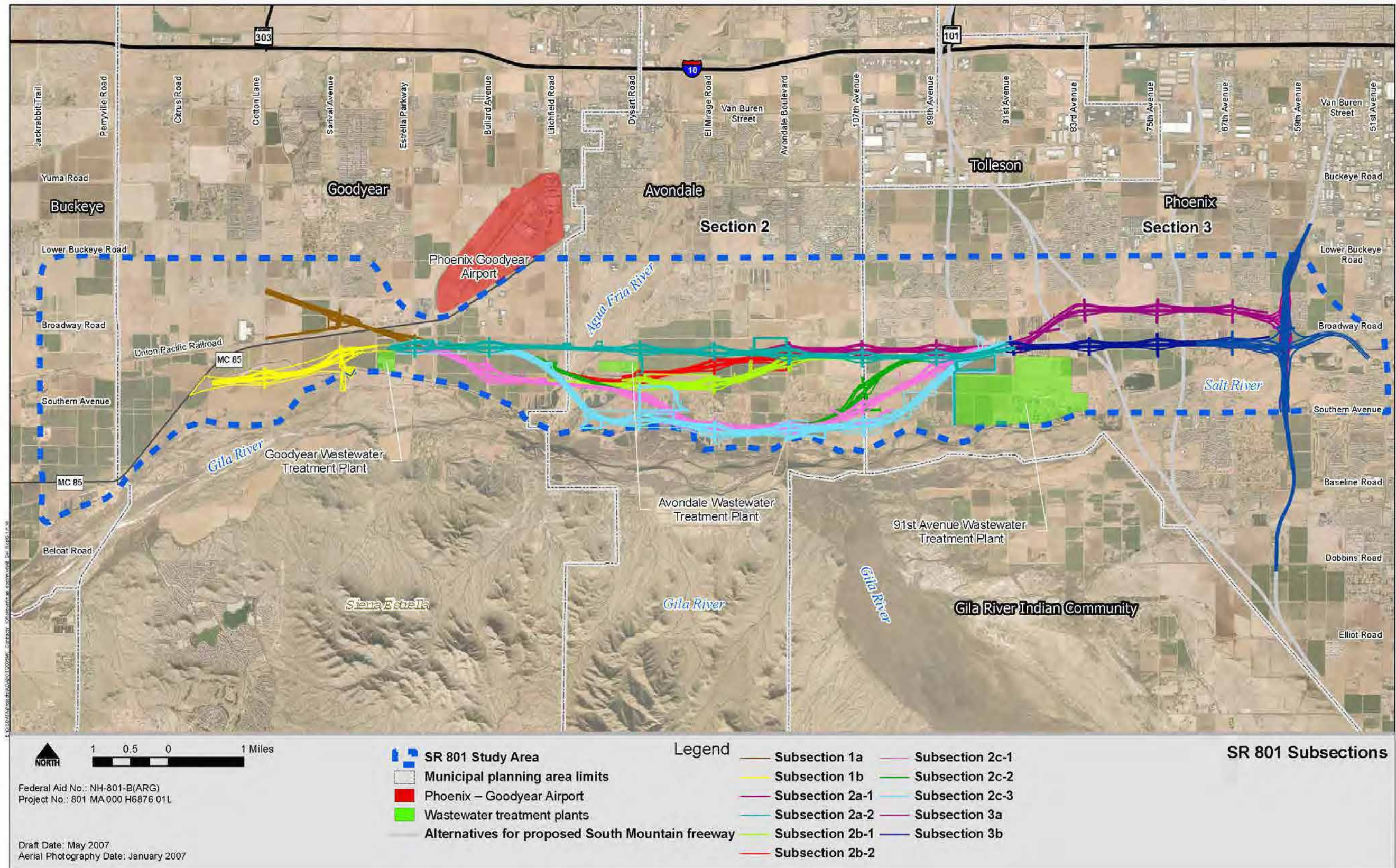
### **3.1 Introduction**

As mentioned previously in this report, seven corridors (subsections) were developed for the purposes of defining alternative alignments for SR 801. The Study Team developed seven alignment layouts within these corridors and named them 1a, 1b, 2a-1, 2b-1, 2c-1, 3a, and 3b. In section 2, four additional layouts (2a-2, 2b-2, 2c-2 and 2c-3) were developed to avoid specific constraints identified during the development of the original seven layouts. These additional layouts required the original 1,000-foot-wide corridors to be expanded.

### **3.2 Subsection Layout Descriptions**

The following paragraphs describe each of the subsection layouts developed within each subsection. As mentioned above, some subsections included multiple layouts, and were designated as such. For instance, Subsection 2a contains layout options 2a-1 and 2a-2. In total, 11 subsection layouts were developed. These 11 layouts are shown in Figure 3.1. To see a detailed set of engineering plans and profiles for each of the 11 layouts, please refer to Appendix A.

Figure 3.1 – Subsections Evaluated



### Subsection 1a Layout

**Description:** Subsection 1a is approximately 1.8 miles long and is shown in Figure 3.2. Its limits extend from approximately the Cotton Lane/Elwood Road intersection on the west to about 1,500 feet south of MC 85 on Estrella Parkway on the east. This northwest-southeast alignment is completely elevated and crosses over Sarival Avenue, the Union Pacific Railroad, MC 85, and Estrella Parkway. Diamond TIs are proposed at Cotton Lane, Sarival Avenue and Estrella Parkway. Overpass bridge structures are required at Cotton Lane, Sarival Avenue, UPRR/MC 85, and Estrella Parkway.

On- and off-site drainage would be conveyed through channels along the north embankment. North of UPRR, the channel would drain southeast along the northern edge of the freeway embankment, then cross under the freeway and would flow back west along the UPRR boundary. This channel would outlet to the proposed SR 303L channel, which is currently planned for just west of Cotton Lane. East of Estrella Parkway, the channel would drain east toward the Bullard Wash. The drainage between the UPRR and Estrella Parkway presented a challenge because of a low point located at the UPRR. Subsection 1a was discontinued from further evaluation prior to a drainage resolution in this area.

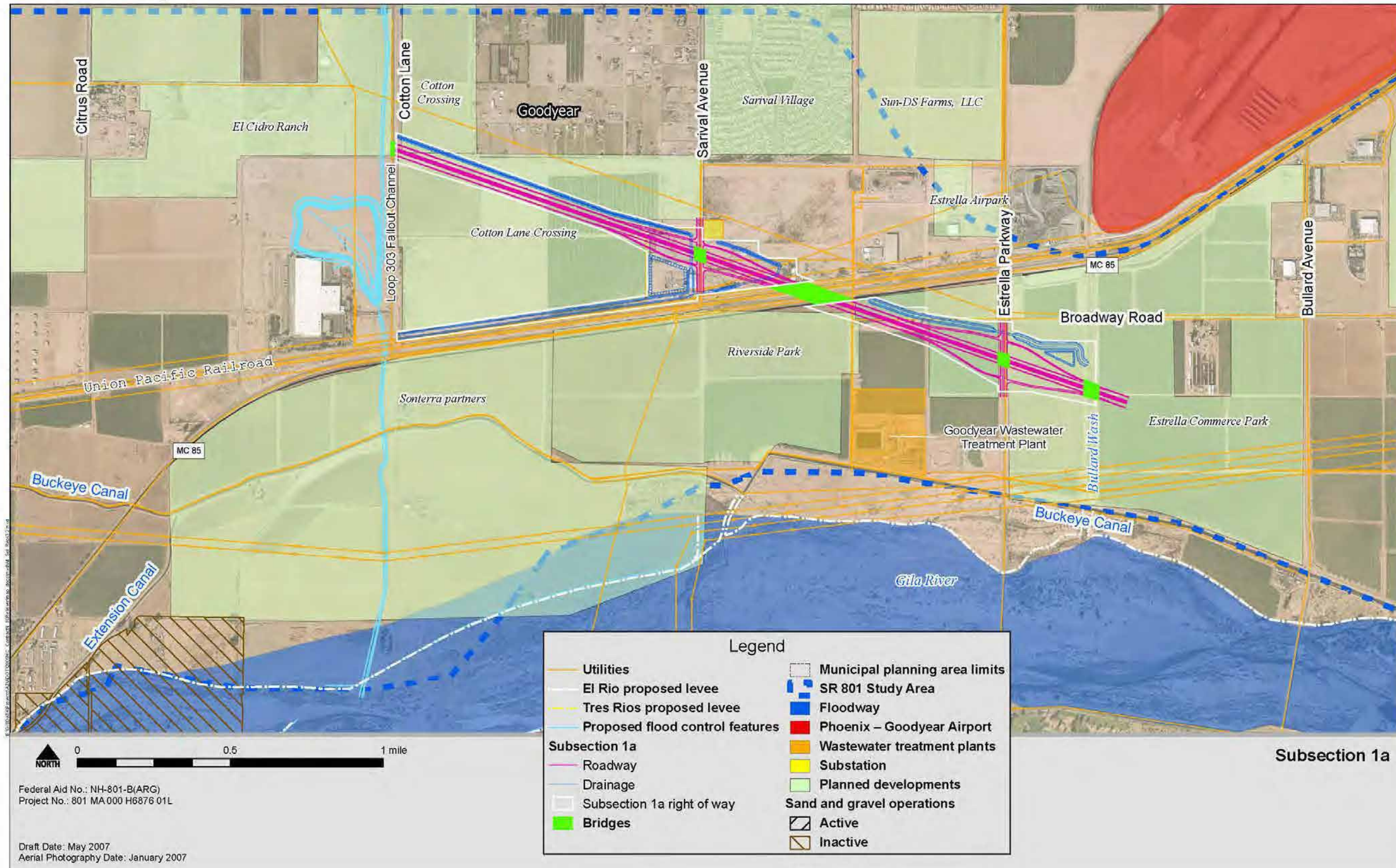
#### Adverse Issues:

1. This layout is not supported by the local government, the City of Goodyear.
2. Based on the findings of the study summarized in Section 3.3 of this report, no feasible SR 801 / SR 303L interchange concepts were identified that utilized the subsection 1a.
3. The UPRR/MC 85 bridge crossing is extremely expensive and challenging because of the numerous utilities within the UPRR right-of-way (four fiber optic facilities and a 20-inch diameter Kinder Morgan petroleum pipeline) and the high skew. If the bridge is built to span the UPRR and avoid the utilities, this bridge is expected to require a long-span system. If the bridge is constructed using more conventional span designs (such as precast concrete girders), then numerous utility relocations would be required. These options were not explored further because this layout was removed from further consideration early in the process.
4. The minimum required vertical clearance over the UPRR is 23 feet; therefore, the grades of the eastbound on-ramp and the westbound off-ramp at Sarival Avenue would be extremely steep, approaching the maximum grades allowed. This would be an undesirable geometric feature. Elimination of the Sarival Avenue TI would need to be considered to eliminate this concern, but this could create local traffic congestion issues.
5. Operational and safety concerns exist on Sarival Avenue between the south ramp terminal and the MC 85/Sarival Avenue intersection. This distance is only about 700 feet and, within this stretch of road, the UPRR signal preemption system must be incorporated. It would be extremely difficult to design the UPRR preemption system to safely preempt two signal systems simultaneously. Furthermore, in the event of an incident, traffic might queue between the signals. If this were to occur when a train was approaching, the chances of a vehicle being stuck on the tracks with no escape route would be high. Elimination of the Sarival Avenue TI would need to be considered to eliminate this concern, but this could create local traffic congestion issues.
6. Four low-level hazardous material sites would be affected by this layout.

7. The drainage outfall as described earlier may be difficult to deliver. The SR 303L outfall channel has not been designed, so it is unclear whether this proposed solution is feasible. Pump stations may be required, especially considering the UPRR embankment and the numerous underground utilities within the UPRR right-of-way that would ultimately have to be crossed. These issues were not explored further because this layout was removed from further consideration.



Figure 3.2 – Subsection 1a Layout



### Subsection 1b Layout

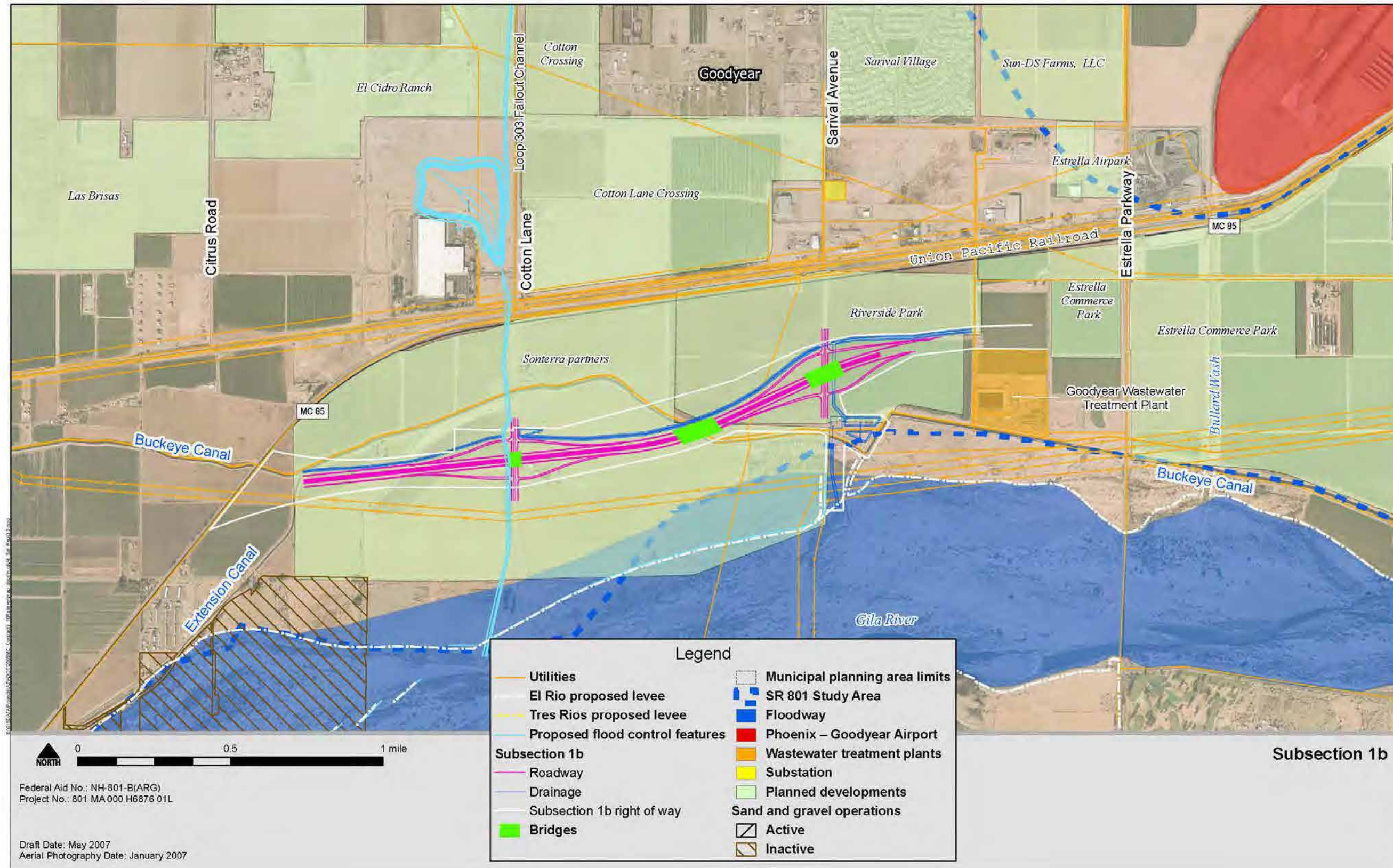
**Description:** Subsection 1b is approximately 2.1 miles long and is shown in Figure 3.3. Its limits extend from about the intersection of MC 85 and the Buckeye Irrigation Canal on the west to about 1,500 feet south of MC 85 on Sarival Avenue on the east. This alignment is completely elevated and crosses over Cotton Lane, the Buckeye Irrigation Canal, and Sarival Avenue and skirts the northern edge of the Goodyear WWTP. Diamond TIs are proposed at Cotton Lane and Sarival Avenue. Three overpass bridge structures are required at Cotton Lane, the Buckeye Canal, and Sarival Avenue.

On- and off-site drainage would be conveyed through channels along the north embankment. West of the Buckeye Canal, the channel would drain toward the SR 303L outfall channel. Between the Buckeye Canal and Estrella Parkway, the channel would drain toward Sarival Avenue and then south to the Gila River. A basin and pump station would be required to drain into the Gila River to pass under the Buckeye Canal. East of Estrella Parkway, the channel would drain east toward the Bullard Wash.

#### Adverse Issues:

1. The drainage outfall at the SR 303L outfall channel would have to be closely coordinated with the development of the SR 303L freeway project. The SR 303L outfall channel has not been designed, so it is unclear whether this proposed solution is feasible.
2. East of the Buckeye Canal crossing, the channel would need to cross the Buckeye Canal and the APS PVNGS pipeline at Sarival Avenue before being discharged into the Gila River. It is assumed that a siphon pipe or an overchute would not be acceptable. Consequently, a pump station is proposed with a force main under both the canal and the APS pipeline.
3. The alignment crosses over a Southwest Gas 8-inch high-pressure natural gas pipeline just west of Sarival Avenue. This pipeline is nearly 50 years old and caution would be required when designing this crossing.
4. Along the northern edge of the Buckeye Canal, the APS PVNGS pipeline parallels the canal with about 5 feet of cover. At this location, the Buckeye Canal Bridge would be designed to span over this pipeline with no impacts. However, because the pipeline under the bridge would be inaccessible to APS in the future, APS would require that portion of the pipeline be encased to ensure that no further maintenance would be required. The cost is estimated at \$2.3 million for this encasement.
5. The need for the Sarival Avenue TI would need to be discussed with the City of Goodyear because Sarival Avenue would never extend south across the Gila River. Consequently, the Sarival TI would not serve anything to the south.
6. Relative to Subsection 1a, Subsection 1b is closer to the northern edge of the Gila River. Consequently, there are several potential environmental issues associated with this subsection. Noise levels would be elevated in the river habitat. Some minor floodplain and jurisdictional water areas would be affected. Numerous groundwater wells would be affected. Visual quality impacts would be greater. Impacts to known prehistoric sites would be greater. Finally, the impacts to planned developments would be greater.

Figure 3.3 – Subsection 1b Layout



### Subsection 2a-1 Layout

**Description:** Subsection 2a is approximately 8.1 miles long and is shown in Figure 3.4. Its limits extend from Estrella Parkway approximately 1,900 feet south of MC 85 to 91st Avenue approximately 1,000 feet south of Broadway Road. The alignment assumes almost a straight east-west line between these two points, with only minor deviations to avoid conflicts. Interchanges are proposed at Estrella Parkway, Bullard Avenue, Dysart Road, El Mirage Road, Avondale Boulevard, 107th Avenue, and 99th Avenue. Overpass bridges are required at each of these interchanges and where the freeway crosses Bullard Wash and the Agua Fria River. A large box culvert/small bridge would be needed ½ mile east of El Mirage Road where the Durango Regional Conveyance Channel (DRCC) would cross under SR 801.

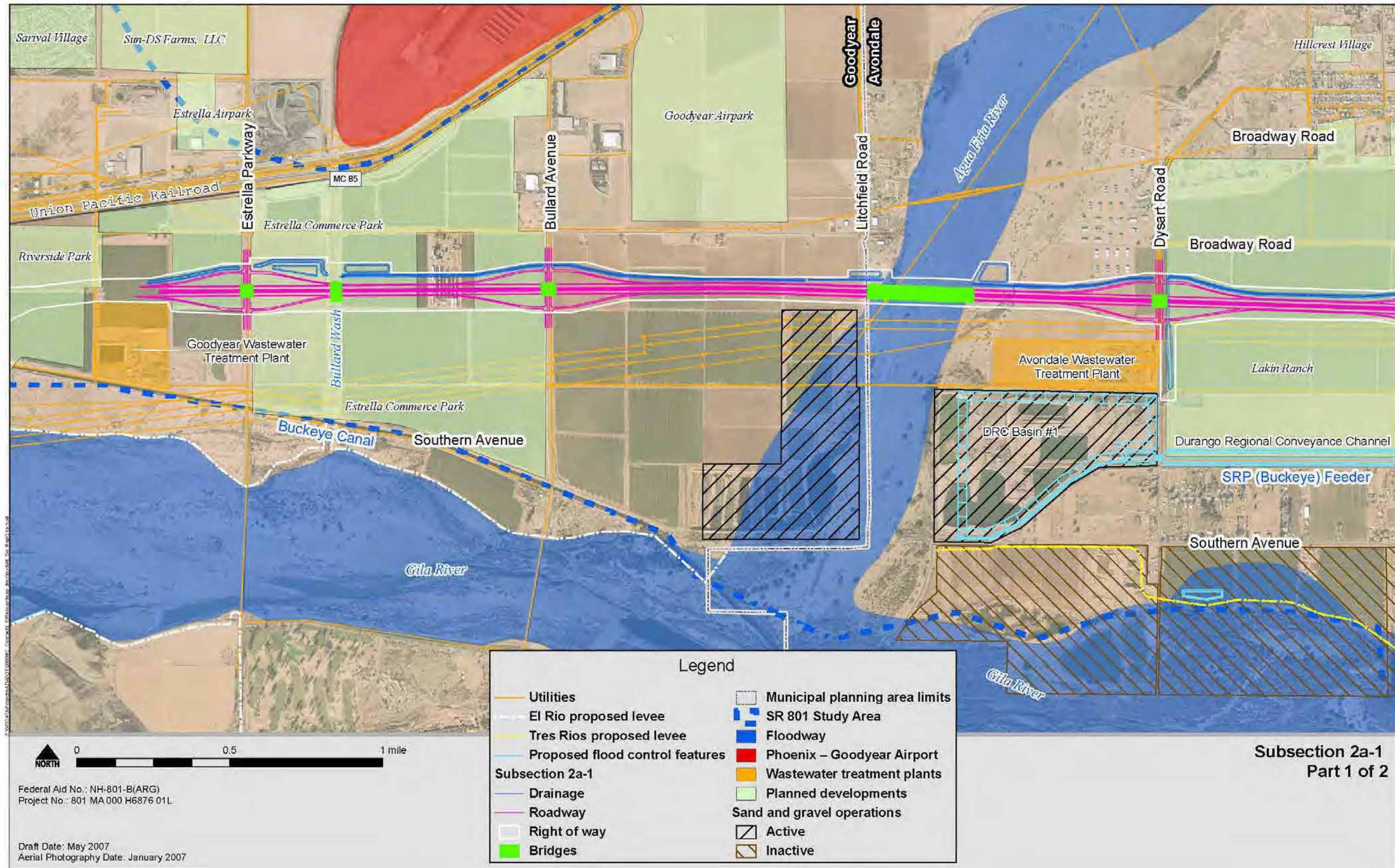
On- and off-site drainage would be conveyed through channels primarily along the north embankment. All drainage east of Estrella Parkway would drain toward the Bullard Wash. A natural high point is located west of Litchfield Road. From this high point to the Dysart Road, all drainage would drain toward the Agua Fria River. Between Dysart Road and El Mirage Road, all storm water would drain toward Dysart Road and then south to the DRCC Basin No. 1 located just south of the Avondale WWTP. Drainage between El Mirage Road and 99th Avenue would drain toward the DRCC crossing at 119th Avenue. East of 99th Avenue, drainage would flow west and discharge to the Salt River via the 97th Avenue alignment about ¼ mile east of 99th Avenue. The DRCC would need to be sized from the confluence point to the outfall to accommodate the additional water. A metering basin may be required upstream of the DRCC confluence to control flow rates.

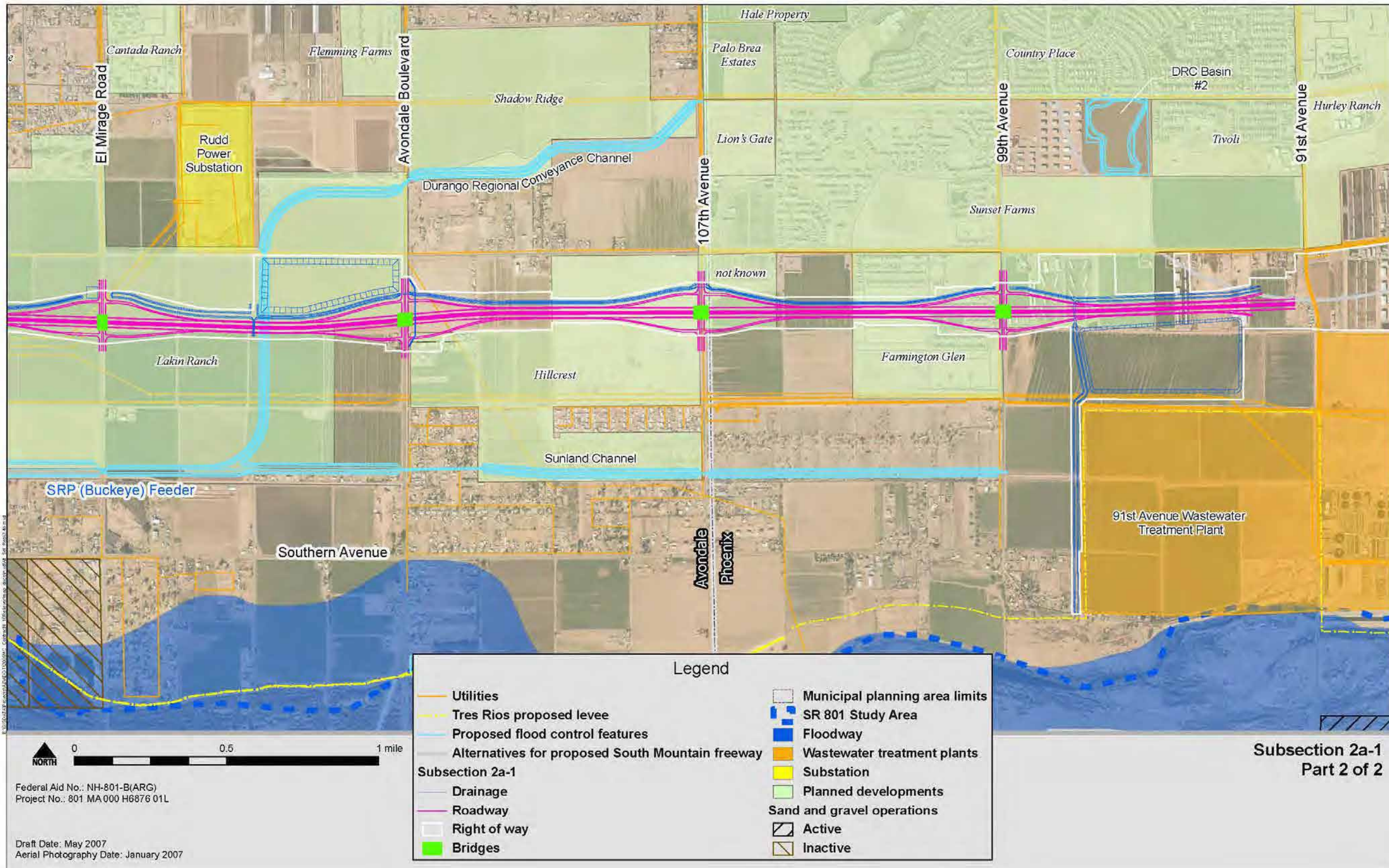
#### Adverse Issues:

1. This layout has no support from the local jurisdictions.
2. This layout affects the planned Lakin Ranch and Hillcrest developments and the existing Farmington Glen development. Lakin Ranch is a master planned community of more than 1,000 acres with approximately 2,700 homes; it has been in the planning phase for several years. This impact has prompted the City of Avondale, with the support of Phoenix, Goodyear and Supervisor Wilcox from Maricopa County, to withhold support for this layout. This layout affects the most planned residential lots (as of the date of this document).
3. This layout affects three planned school sites associated with the planned development.
4. At the El Mirage Road interchange, two major high-voltage power lines (230 and 500 kV) feeding the Rudd Substation complex cross the proposed SR 801 alignment. Resulting vertical clearance would be below allowable limits and the bridge construction would be constrained under the power lines. Consequently, the power lines would need to be relocated. These relocations would require both horizontal and vertical adjustments. New right-of-way/easements would be required for the new power line alignments.
5. An El Paso Natural Gas pipeline would either need to be encased or relocated under the freeway embankment just east of Avondale Boulevard.
6. This layout affects the most number of acres with known prehistoric sites.
7. The Buckeye Feeder Canal would need to be relocated into a box culvert under the Avondale Boulevard TI and would likely need to be siphoned under the drainage channel.

8. Coordination with FCDMC would be essential for both the Bullard Wash and the proposed DRCC.

Figure 3.4 – Subsection 2a-1 Layout





### Subsection 2a-2 Layout

**Background:** Subsection 2a-2 was developed in response to feedback from the FHWA regarding Subsection 2a-1. Subsection 2a-1 was located immediately north of the power line corridor from El Mirage Road west. However, rather than shifting south to stay next to the power line corridor east of El Mirage, 2a-1 remained on a straight alignment. Subsection 2a-2 was developed with a southerly shift in the 2a-1 alignment east of El Mirage Road to maximize the distance between the Broadway Road signals and the interchange signals and to maximize land use opportunities between SR 801 and Broadway Road.

**Description:** Subsection 2a-2 is approximately 8.1 miles long and is shown in Figure 3.5. Almost identical to Subsection 2a-1, the only change in 2a-2 is between Avondale Boulevard and 91st Avenue where the alignment drops approximately 500 feet to the south before coming back up. Its limits extend from Estrella Parkway approximately 1,900 feet south of MC 85 to 91st Avenue approximately 1,000 feet south of Broadway Road. Interchanges are proposed at Estrella Parkway, Bullard Avenue, Dysart Road, El Mirage Road, Avondale Boulevard, 107th Avenue, and 99th Avenue. Overpass bridges are required at each of these interchanges and where the freeway crosses the Bullard Wash and the Agua Fria River. A large box culvert/small bridge would be needed ½ mile east of El Mirage Road where the proposed DRCC would cross under the freeway.

On- and off-site drainage would be conveyed through channels primarily along the north embankment. All drainage east of Estrella Parkway would drain toward the Bullard Wash. A natural high point is located west of Litchfield Road. From this high point to the Dysart Road, all drainage would drain toward the Agua Fria River. Between Dysart Road and El Mirage Road, storm water would drain toward Dysart Road and then south to the DRCC Basin No. 1 located just south of the Avondale WWTP. Drainage between El Mirage Road and 99th Avenue would drain toward the DRCC crossing at 119th Avenue. East of 99th Avenue, drainage would flow west and discharge to the Salt River via the 97th Avenue alignment (about ¼ mile east of 99th Avenue).

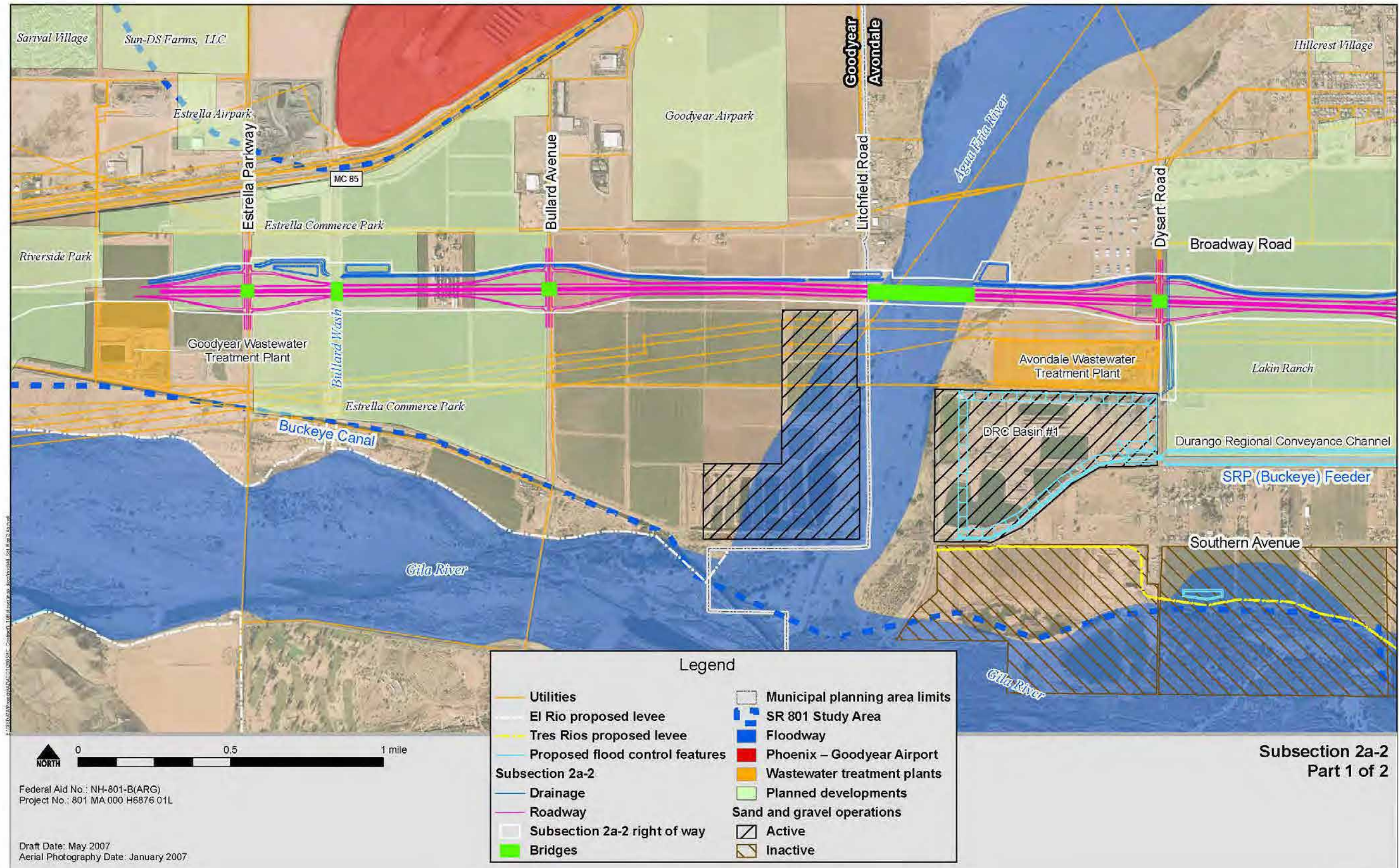
The DRCC would need to be sized from the confluence point to the outfall to accommodate the additional water. A metering basin may be required upstream of the DRCC confluence to control flow rates.

#### Adverse Issues:

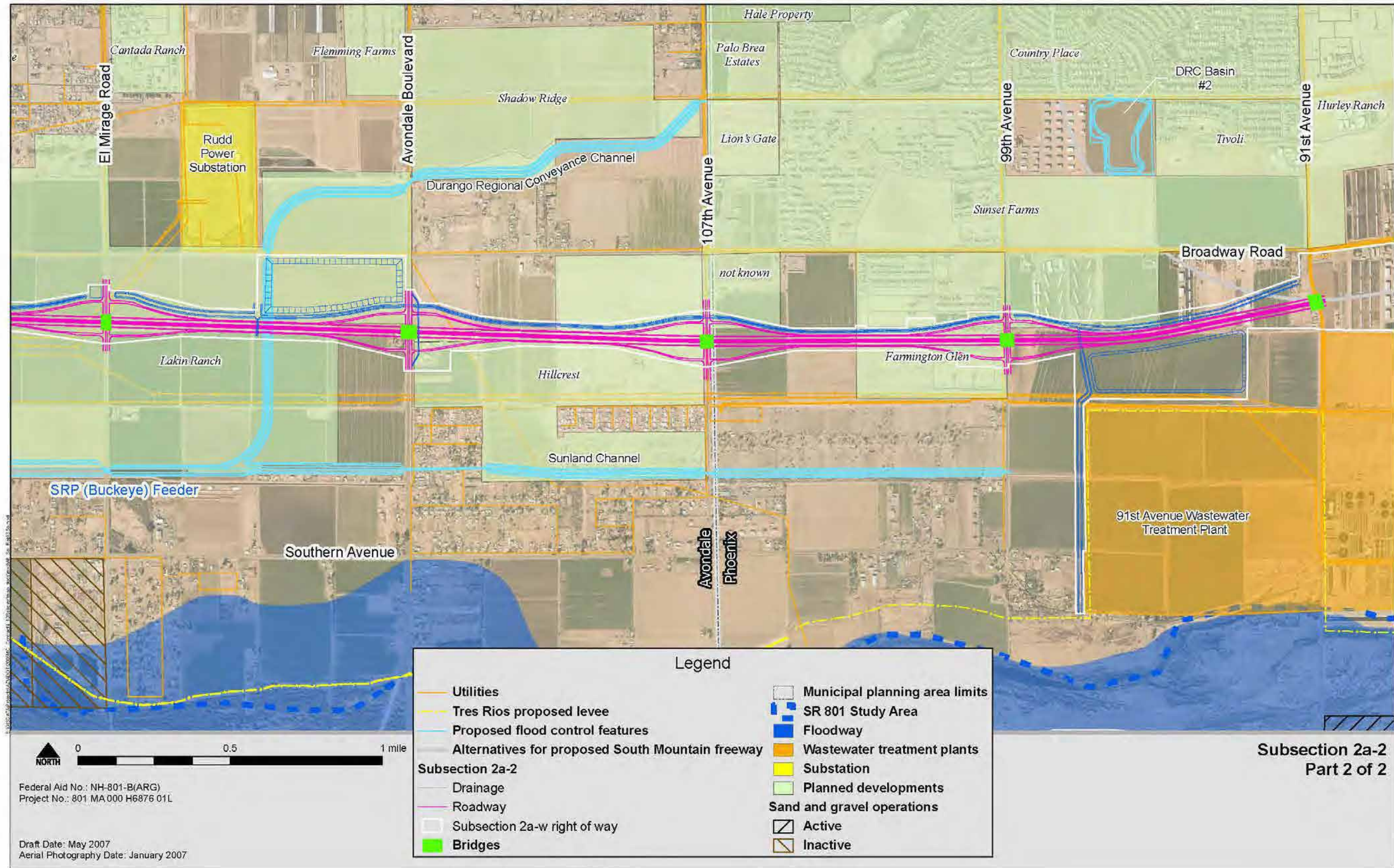
1. This layout has no support from the local jurisdictions.
2. This layout affects the planned Lakin Ranch and Hillcrest developments and the existing Farmington Glen development. Lakin Ranch is a master planned community of more than 1,000 acres with approximately 2,700 homes; it has been in the planning phase for several years. This impact has prompted the City of Avondale, with the support of Phoenix, Goodyear and Supervisor Wilcox from Maricopa County, to withhold support for this layout. This layout affects the most planned residential lots (as of the date of this document).
3. This layout affects three planned school sites associated with the planned development.
4. At the El Mirage Road interchange, two major high-voltage power lines (230 and 500 kV) feeding the Rudd Substation complex cross the proposed SR 801 alignment. Resulting vertical clearance would be below allowable limits and the bridge construction would be constrained under the power lines. Consequently, the power lines would need to be relocated. These relocations would require both horizontal and vertical adjustments. New right-of-way/easements would be required for the new power line alignments.

5. An El Paso Natural Gas pipeline would either need to be encased or relocated under the freeway embankment just east of Avondale Boulevard.
6. This layout impacts the most number of acres of known prehistoric sites.
7. The Buckeye Feeder Canal would need to be relocated into a box culvert under the Avondale Boulevard TI and would likely need to be siphoned under the drainage channel.
8. Coordination with the FCDMC would be essential for both the Bullard Wash and the proposed DRCC.

Figure 3.5 – Subsection 2a-2 Layout







### Subsection 2b-1 Layout

**Description:** Subsection 2b-1 is approximately 8.2 miles long and is shown in Figure 3.6. Its limits extend from Estrella Parkway approximately 1,500 feet south of MC 85 to 91st Avenue approximately 1,000 feet south of Broadway Road. Beginning at the west end, the alignment heads southeast between Estrella Parkway and Bullard Avenue. At Bullard Avenue, it turns east until El Mirage Road. At El Mirage Road, the alignment turns northeast to Avondale Boulevard. At Avondale Boulevard Avenue about 1,600 feet south of Broadway Road, the alignment again turns roughly east to 91st Avenue. Interchanges are proposed at Estrella Parkway, Bullard Avenue, Dysart Road, El Mirage Road, Avondale Boulevard, 107th Avenue, and 99th Avenue. Overpass bridges are required at each of these interchanges and where the freeway crosses the Bullard Wash and the Agua Fria River/proposed DRCC Basin No. 1. It is assumed at this level of design that the Agua Fria River bridge would be extended to span the proposed DRCC Basin No. 1 to maintain the integrity of the planned regional drainage system.

On- and off-site drainage would be conveyed through channels primarily along the north embankment. All drainage between Estrella Parkway and ½ mile east of Bullard Avenue would drain toward the Bullard Wash. From ½ mile east of Bullard Avenue to the Agua Fria River, all drainage would drain toward the Agua Fria River. Between the Agua Fria River and 119th Avenue, the freeway is located where the DRCC Basin No. 1 and the DRCC are planned to be located. Consequently, it is envisioned that the DRCC and the freeway drainage channel would merge along the north side of the freeway in this reach. In addition, because some volume of the DRCC Basin No. 1 would be lost to freeway embankment, an additional in-line basin is envisioned between Dysart Road and El Mirage Road along the channel to mitigate this lost volume. Between 119th Avenue and 99th Avenue, all drainage would drain toward 119th Avenue where it would merge into the DRCC. This portion of the channel may replace the proposed Sunland Channel. However, if the Sunland Channel is still needed, a connection from the Sunland Channel to the DRCC would need to be incorporated under the freeway in the vicinity of El Mirage Road. East of 99th Avenue, drainage would flow west and discharge to the Salt River via the 97th Avenue alignment (about ¼ mile east of 99th Avenue).

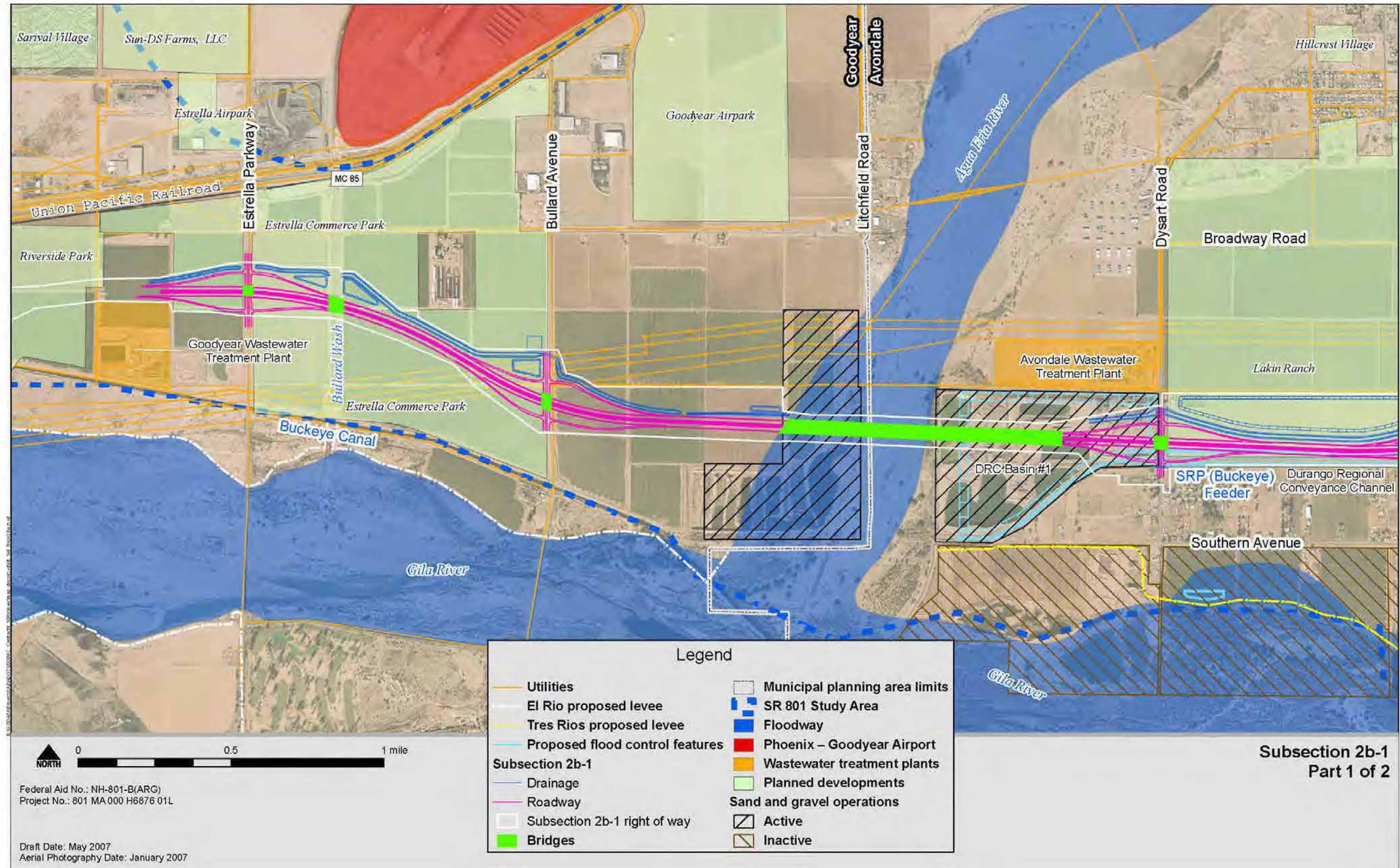
#### Adverse Issues:

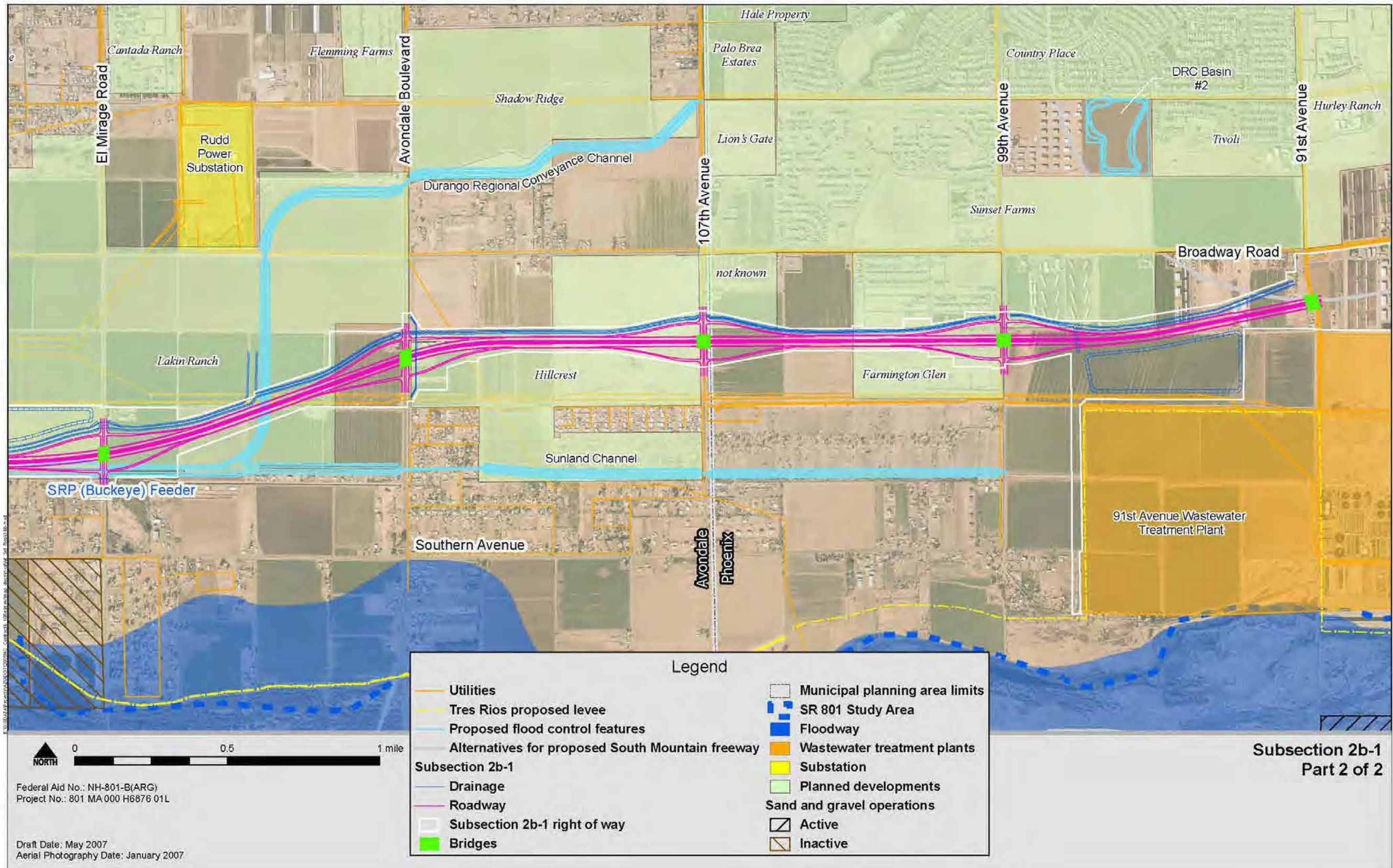
1. This layout has no support from the local jurisdictions.
2. This layout affects the planned Lakin Ranch and Hillcrest developments and the existing Farmington Glen development. Lakin Ranch is a large master planned community that has been in the planning phase for several years. It is because of this impact that the community does not support this layout. This layout affects a large number of planned residential lots.
3. The roadway geometry for this layout is less direct.
4. The construction cost for this layout is approximately \$163 million more than the cheapest Segment 2 subsection, which is 2a-2. This is primarily because the Agua Fria River bridge is assumed to cross both the Agua Fria River and the DRCC Basin No. 1, making it an extremely long bridge. In addition, major utility adjustments also contribute to the cost.
5. This layout affects two current sand and gravel operations. Right-of-way costs and economic impacts are being evaluated to quantify this impact.
6. The Bullard Avenue TI would require a 1,900-foot-long encasement of the APS pipeline at a cost of about \$7.3 million. In addition, between El Mirage Road and Avondale Boulevard, 1,200 feet of

encasement of the APS pipeline at a cost of about \$4.6 million would also be required. While this is feasible, it would take several years to accomplish this encasement.

7. The Bullard Avenue TI would require four major high voltage overhead transmission power line relocations with sizes ranging from 230 kV to 500 kV and include APS, SRP, TEP, and WAPA. Because of allowable outage windows and the time required to perform a relocation, these four power lines could take 6 to 7 years to relocate because only one relocation per year could probably be scheduled. These relocations would require both horizontal and vertical adjustments. New right-of-way/easements would be required for the new power line alignments. Cost of these relocations could easily exceed \$10 million.
8. The Buckeye Feeder Canal would need to be relocated into a box culvert under the Avondale Boulevard TI and would likely need to be siphoned under the drainage channel.
9. An El Paso Natural Gas pipeline would either need to be encased or relocated under the freeway embankment just east of Avondale Boulevard.
10. Coordination with the FCDMC would be essential for both the Bullard Wash and the proposed DRCC. In addition, since the DRCC and the freeway channel might be merged, cost share opportunities for this shared facility would need to be explored.
11. Within the Agua Fria River, there exists the possibility of a man-induced wetland impact in the area of the Avondale WWTP outfall structure. In addition, because this option requires one of the largest Agua Fria River bridges, the potential jurisdictional water impacts are among the highest.

Figure 3.6 – Subsection 2b-1 Layout





### Subsection 2b-2 Layout

**Background:** Subsection 2b-2 was developed to resolve two of the significant technical challenges that were uncovered during the development of Subsection 2b-1: the two APS 114-inch pipeline encasements and the high voltage overhead power line relocations. To accomplish this, the alignment of Subsection 2b-2 was shifted outside the 1,000-foot corridors in two locations (between Bullard Avenue and the Agua Fria River and between Dysart Road and Avondale Boulevard).

**Description:** Subsection 2b-2 is approximately 8.2 miles long and is shown in Figure 3.7. Its limits extend from Estrella Parkway approximately 1,500 feet south of MC 85 to 91st Avenue approximately 1,000 feet south of Broadway Road. Beginning at the west end, the alignment heads east between Estrella Parkway and Bullard Avenue. At Bullard Avenue, it turns southeast towards the Agua Fria River. At the Agua Fria River, the alignment turns east-northeast until it intersects Avondale Boulevard. At this point, the alignment turns east to 91st Avenue. Interchanges are proposed at Estrella Parkway, Bullard Avenue, Dysart Road, El Mirage Road, Avondale Boulevard (115th Avenue), 107th Avenue, and 99th Avenue. Overpass bridges are required at each of these interchanges and where the freeway crosses the Bullard Wash and the Agua Fria River/DRCC Basin No. 1. It is assumed at this level of design that the Agua Fria River bridge would be extended to span the proposed DRCC Basin No. 1 to maintain the integrity of the planned regional drainage system.

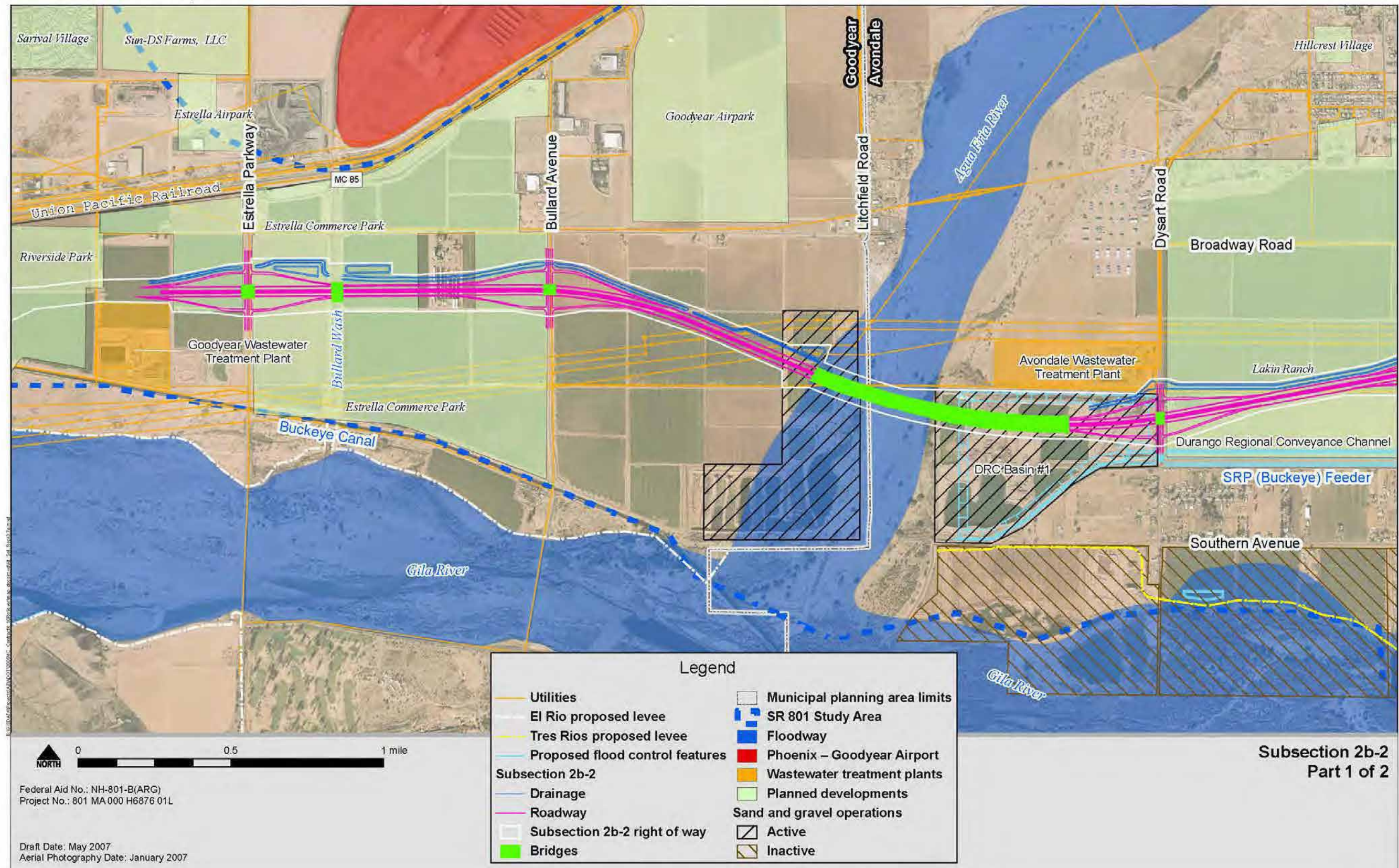
On- and off-site drainage would be conveyed through channels primarily along the north embankment. All drainage between Estrella Parkway and ½ mile east of Bullard Avenue would drain toward the Bullard Wash. From ½ mile east of Bullard Avenue to 99th Avenue, all drainage would drain toward the Agua Fria River with the drainage on the east side of the Agua Fria River going through the DRCC Basin No. 1. East of 99th Avenue, drainage would flow west and discharge to the Salt River via the 97th Avenue alignment (about ¼ mile east of 99th Avenue). The DRCC flows in a box culvert under the freeway embankment to the south at approximately 119th Avenue. The necessity of the Sunland Channel would need to be evaluated further if this layout is carried forward.

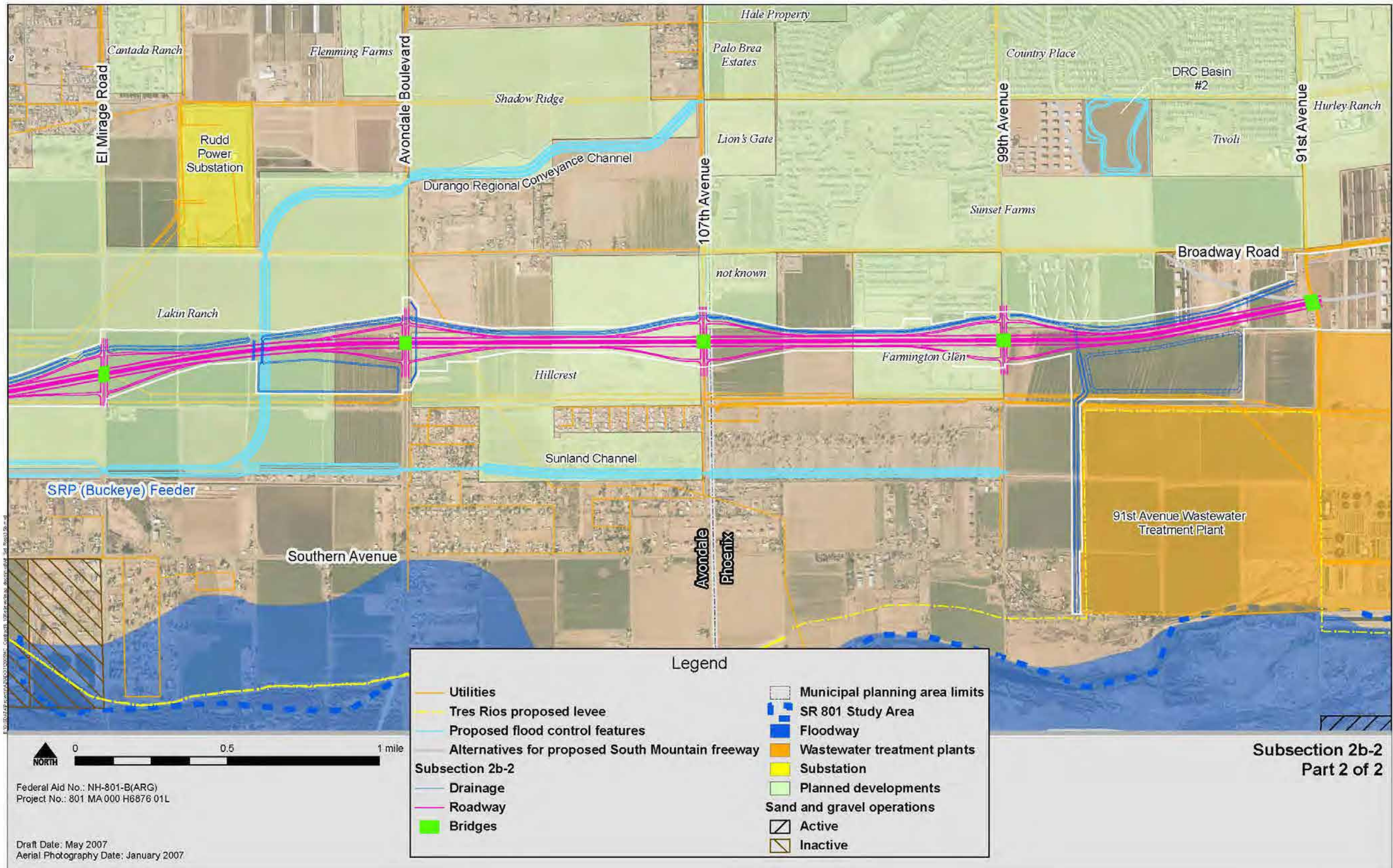
#### Adverse Issues:

1. This layout has no support from the local jurisdictions.
2. This layout affects the planned Lakin Ranch and Hillcrest developments and the existing Farmington Glen development. Lakin Ranch is a large master planned community that has been in the planning phase for several years. It is because of this impact that the community does not support this layout. This layout affects a large number of planned residential lots.
3. The roadway geometry for this layout is less direct.
4. The construction cost for this layout is approximately \$116 million more than the cheapest Segment 2 layout, which is 2a-2. This is primarily because the Agua Fria River bridge is assumed to cross both the Agua Fria River and the DRCC Basin No. 1, making it an extremely long bridge.
5. This layout affects two current sand and gravel operations. Right-of-way costs and economic impacts are being evaluated to quantify this impact.
6. The alignment crosses the APS 114-inch pipeline in the Agua Fria River bottom. The bridge piers would need to be designed to avoid this facility.

7. Between Dysart Road and El Mirage Road, a 2,000-foot encasement of the APS 114-inch effluent pipeline is required at a cost of about \$7.7 million.
8. The SRP 500 kV overhead power lines would need to be relocated, both horizontally and vertically, because of clearance requirements at the El Mirage Road TI.
9. At about 119th Avenue, the proposed DRCC would need to cross under the freeway alignment. This system may exist at the time of construction and can remain independent. Alternatively, the DRCC may also become the freeway drainage outfall if the channels merge or may be eliminated if it is located north of the freeway embankment.
10. The Buckeye Feeder Canal would need to be relocated into a box culvert under the Avondale Boulevard TI and would likely need to be siphoned under the drainage channel.
11. An El Paso Natural Gas pipeline would either need to be encased or relocated under the freeway embankment just east of Avondale Boulevard.
12. Coordination with the FCDMC would be essential for both the Bullard Wash and the proposed DRCC. In addition, since the DRCC and the freeway channel might be merged, cost share opportunities for this shared facility would need to be explored.
13. Within the Agua Fria River, there exists the possibility of a man-induced wetland impact in the area of the Avondale WWTP outfall structure. In addition, because this option requires one of the largest Agua Fria River bridges, the jurisdictional water impacts are among the highest.

Figure 3.7 – Subsection 2b-2 Layout





### Subsection 2c-1 Layout

**Description:** Subsection 2c-1 is approximately 8.5 miles long and is shown in Figure 3.8. Its limits extend from Estrella Parkway approximately 1,500 feet south of MC 85 to 91st Avenue approximately 1,000 feet south of Broadway Road. Beginning at the west end, the alignment heads southeast between Estrella Parkway and Bullard Avenue. At Bullard Avenue, it turns east for about 2 miles as it crosses over the Agua Fria River. At Dysart Road, the freeway again turns southeast for 1 mile, crossing over Southern Avenue to El Mirage Road where it crosses about 1,200 feet south of Southern Avenue. Between El Mirage Road and Avondale Boulevard, the freeway parallels Southern Avenue heading east. At Avondale Boulevard, the alignment turns northeast and eventually intersects 91st Avenue about 1,000 feet south of Broadway Road. An arterial street modification would be required for Southern Avenue at the 107th Avenue TI because the 107th Avenue/Southern Avenue intersection would fall directly under the 107th Avenue TI. Therefore, a realignment of Southern Avenue to the south around the TI is proposed. Interchanges are proposed at Estrella Parkway, Bullard Avenue, Dysart Road, El Mirage Road, Avondale Boulevard, 107th Avenue, and 99th Avenue. Overpass bridges are required at each of these interchanges and where the freeway crosses the Bullard Wash, the Agua Fria River/DRCC Basin No. 1, and Southern Avenue between Dysart Road and El Mirage Road and between Avondale Boulevard and 107th Avenue. It is assumed at this level of design that the Agua Fria River bridge would be extended to span the proposed DRCC Basin No. 1 to maintain the integrity of the planned regional drainage system.

On- and off-site drainage would be conveyed through channels primarily along the north embankment. All drainage between Estrella Parkway and ½ mile east of Bullard Avenue would drain toward the Bullard Wash. From ½ mile east of Bullard Avenue to Dysart Road, all drainage would drain toward the Agua Fria River, using the DRCC Basin No. 1 on the east side of the Agua Fria River. Between Dysart Road and Avondale Boulevard, the drainage would outfall under the freeway and through the Tres Rios (formerly the Holy Acres) Levee approximately ½ mile west of El Mirage Road. Between Avondale Boulevard and 99th Avenue, the drainage would outfall under the freeway just east of Avondale Boulevard through the Tres Rios Levee. East of 99th Avenue, drainage would flow west and discharge to the Salt River via the 97th Avenue alignment about ¼ mile east of 99th Avenue. Because of the potential problems with a river outfall, in-line basins are assumed along the north side of the freeway to meter the flows and to assist with water quality if warranted. At about 103rd Avenue, the proposed Sunland Channel would cross the freeway. Because this freeway would essentially intercept any flows that would enter the Sunland Channel east of this crossing, it is assumed that the Sunland Channel would be truncated on the west side of the freeway and no crossing would be needed at 103rd Avenue. As an alternative design, the freeway channel from 103rd Avenue east could outfall into the Sunland Channel, significantly decreasing the flows that would enter the Salt River south of the Sunland Channel.

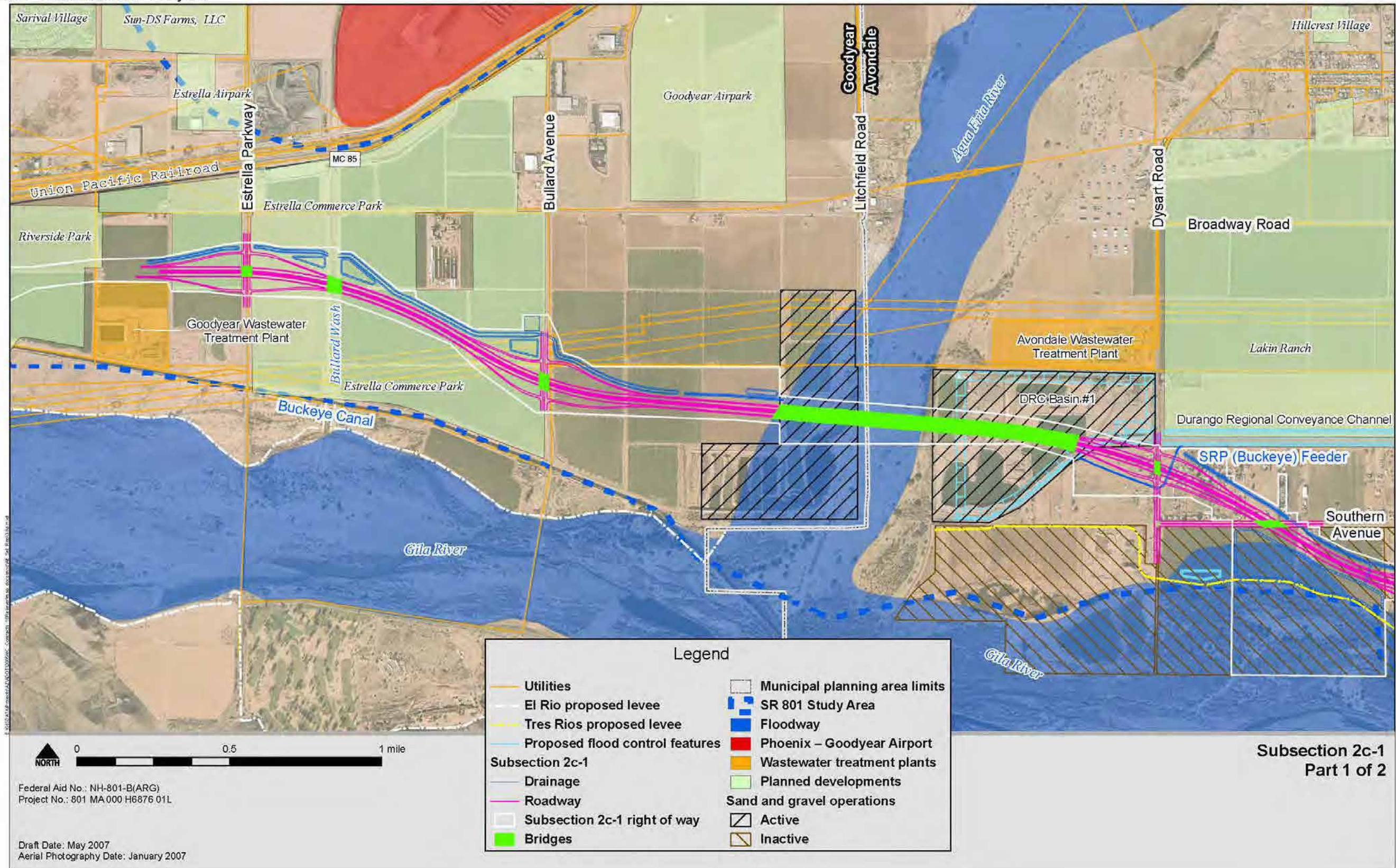
#### Adverse Issues:

1. The construction cost for this layout is approximately \$196 million more than the cheapest Segment 2 layout, which is 2a-2, making this layout the most expensive. This is primarily because the Agua Fria River Bridge is assumed to cross both the Agua Fria River and the DRCC Basin No. 1, making it an extremely long bridge, and because this option requires two additional bridges crossing Southern Avenue. In addition, major utility adjustments and additional roadway length (this layout is about ½ mile longer than 2a-2) contribute to the additional cost.
2. The right-of-way cost for this layout is about \$63 million more than the cheapest Segment 2 right-of-way cost, which is for layout 2b-2. This additional cost is due to the longer roadway length and the 200 additional residential displacements.

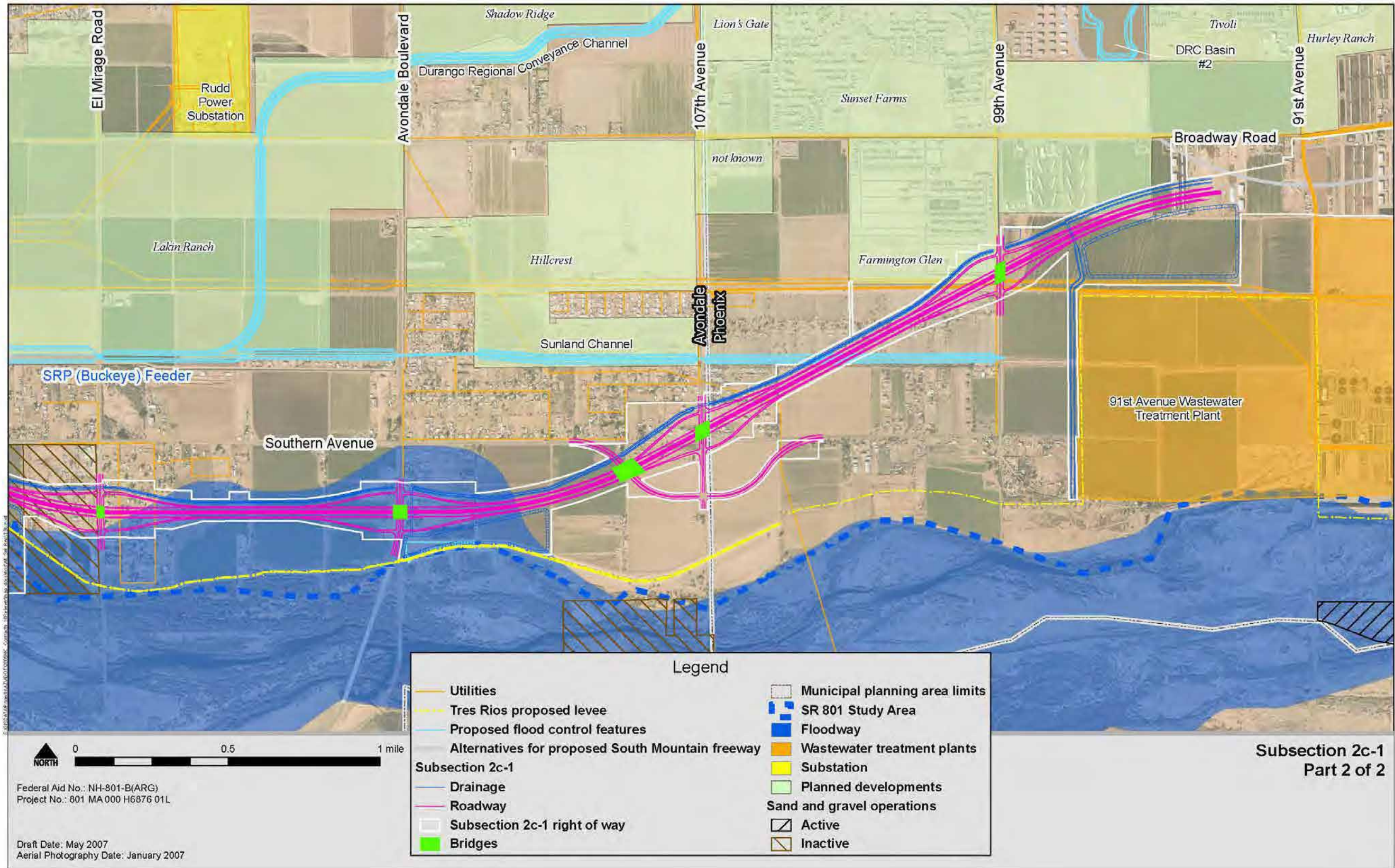
3. This layout affects three past, current, or planned sand and gravel operations.
4. The roadway geometry for this layout is less direct.
5. The proximity of this layout to the Gila River and the Tres Rios project creates some substantial drainage challenges, both in terms of flood control and water quality.
6. The Bullard Avenue TI would require a 1,900-foot-long encasement of the APS PVNGS pipeline at a cost of about \$7.3 million. In addition, at 99th Avenue, a 1,500-foot encasement of the APS pipeline at a cost of about \$5.8 million would also be required. While this is feasible, it would take several years to accomplish these encasements.
7. The Bullard Avenue TI would require four major high voltage overhead transmission power line relocations with sizes ranging from 230 kV to 500 kV and include APS, SRP, TEP, and WAPA. Because of allowable outage windows and the time required to perform a relocation, these four power lines could take 6 to 7 years to relocate because only one relocation per year could probably be scheduled. These relocations would require both horizontal and vertical adjustments. New right-of-way/easements would be required for the new power line alignments. Cost of these relocations could easily exceed \$10 million.
8. The 99th Avenue TI requires a 500 kV overhead power line relocation, horizontally and vertically. New right-of-way/easements would be required. The approximate cost is \$2 million.
9. At the Dysart Road TI, the Buckeye Feeder Canal would need to be relocated through the interchange on a different alignment.
10. Because of the proximity to the Agua Fria River, the Gila River and the Tres Rios project, numerous environmental concerns exist. These include elevated noise levels within wildlife habitat and a high potential for floodplain and jurisdictional water impacts.
11. Two high-risk hazardous material sites would be affected along Southern Avenue.
12. The historic St. Johns Canal is a small lined ditch located along the south side of Southern Avenue. It would be crossed at two locations. This canal would be afforded Section 4(f) protection. Impacts to this canal would have to be avoided if possible.
13. Visual impacts would be the greatest because the river and mountain views along the river are currently unobstructed by manmade elements.
14. The probability of environmental justice issues would be the greatest with this layout because it affects more homes than the other Section 2 options and because the homes being affected, primarily along the Gila River, are more likely to fall within the environmental justice categories.
15. Coordination with FCDMC regarding Bullard Wash and the DRCC Basin No. 1 would be essential.
16. Coordination will be required with FCDMC, U.S. Army Corps of Engineers, and City of Phoenix for the drainage outfalls through the Tres Rios Levee between Dysart Road and 107th Avenue.
17. The team would need to work with the City of Avondale and the City of Phoenix to gain consensus on how Southern Avenue should be realigned near the 107th Avenue TI.



Figure 3.8 – Subsection 2c-1 Layout



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### Subsection 2c-2 Layout

**Background:** Subsection 2c-2 was developed to resolve some of the significant technical challenges that were uncovered during the development of Subsection 2c-1. To accomplish this, the alignment of Subsection 2c-2 was shifted outside the 1,000-foot-wide corridors in two locations (between Bullard Wash and the Agua Fria River and between Avondale Boulevard and 99th Avenue).

**Description:** Subsection 2c-2 is approximately 8.6 miles long and is shown in Figure 3.9. Its limits extend from Estrella Parkway approximately 1,500 feet south of MC 85 to 91st Avenue approximately 1,000 feet south of Broadway Road. Beginning at the west end, the alignment heads east between Estrella Parkway and Bullard Avenue. At Bullard Avenue, it turns southeast across the Agua Fria River to El Mirage Road where it crosses about 1,200 feet south of Southern Avenue. Between El Mirage Road and Avondale Boulevard, the freeway parallels Southern Avenue heading east. At Avondale Boulevard, the alignment turns northeast until it intersects 99th Avenue about 1,500 feet south of Broadway Road. Between 99th Avenue and 91st Avenue, the alignment is oriented east-northeast and crosses 91st Avenue about 1,000 feet south of Broadway Road. An arterial street modification would be required for 107th Avenue, within the 107th Avenue TI, to achieve a more desirable skew of the interchange. Interchanges are proposed at Estrella Parkway, Bullard Avenue, Dysart Road, El Mirage Road, Avondale Boulevard, 107th Avenue, and 99th Avenue. Overpass bridges are required at each of these interchanges and where the freeway crosses the Bullard Wash, the Agua Fria River/DRCC Basin No. 1, and Southern Avenue between Dysart Road and El Mirage Road and between Avondale Boulevard and 107th Avenue. It is assumed at this level of design that the Agua Fria River bridge would be extended to span the proposed DRCC Basin No. 1 to maintain the integrity of the planned regional drainage system.

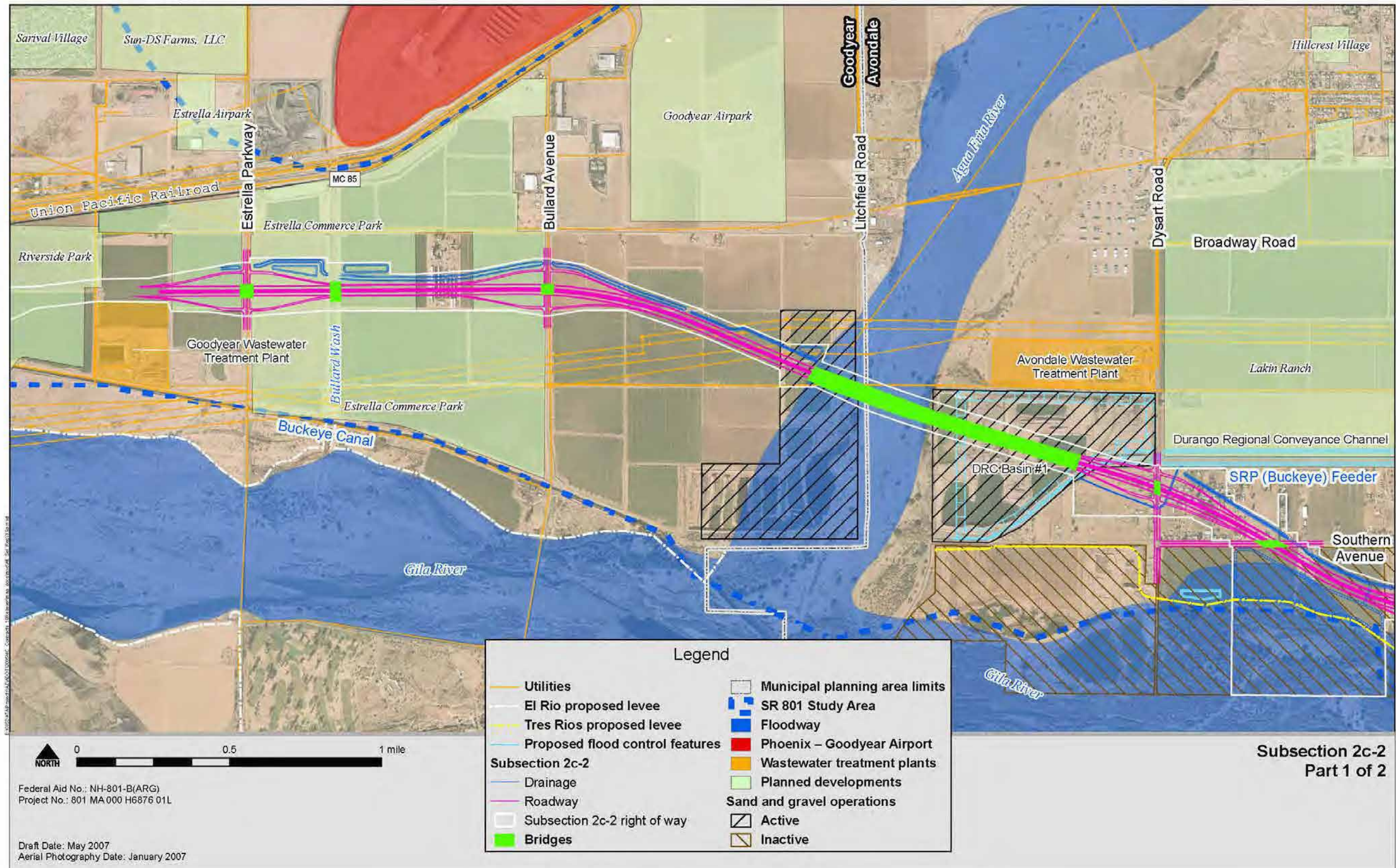
On- and off-site drainage would be conveyed through channels primarily along the north embankment. All drainage between Estrella Parkway and ½ mile east of Bullard Avenue would drain toward the Bullard Wash. From Bullard Avenue to Dysart Road, all drainage would drain toward the Agua Fria River with the drainage on the east side of the Agua Fria River going through the DRCC Basin No. 1. Between Dysart Road and Avondale Boulevard, the drainage would outfall under the freeway and through the Tres Rios Levee approximately ½ mile west of El Mirage Road. Between Avondale Boulevard and 99th Avenue, the drainage would outfall under the freeway approximately ¼ mile east of Avondale Boulevard through the Tres Rios Levee. East of 99th Avenue, drainage would flow west and discharge to the Salt River via the 97th Avenue alignment (about ¼ mile east of 99th Avenue). Because of the potential problems with a river outfall, in-line basins are assumed along the north side of the freeway to meter the flows and to assist with water quality, if warranted. The proposed Sunland Channel would cross the freeway under the 107th Avenue TI. A realignment of the Sunland Channel under and around the 107th Avenue TI is being proposed; however, because this freeway would intercept most of the flows that would enter the Sunland Channel east of this crossing, it may be found that the Sunland Channel would be truncated on the west side of the freeway and no crossing would be needed at 107th Avenue. As an alternative design, the freeway channel from 107th Avenue east could outfall into the Sunland Channel, significantly decreasing the flows that would enter the Salt River south of the Sunland Channel.

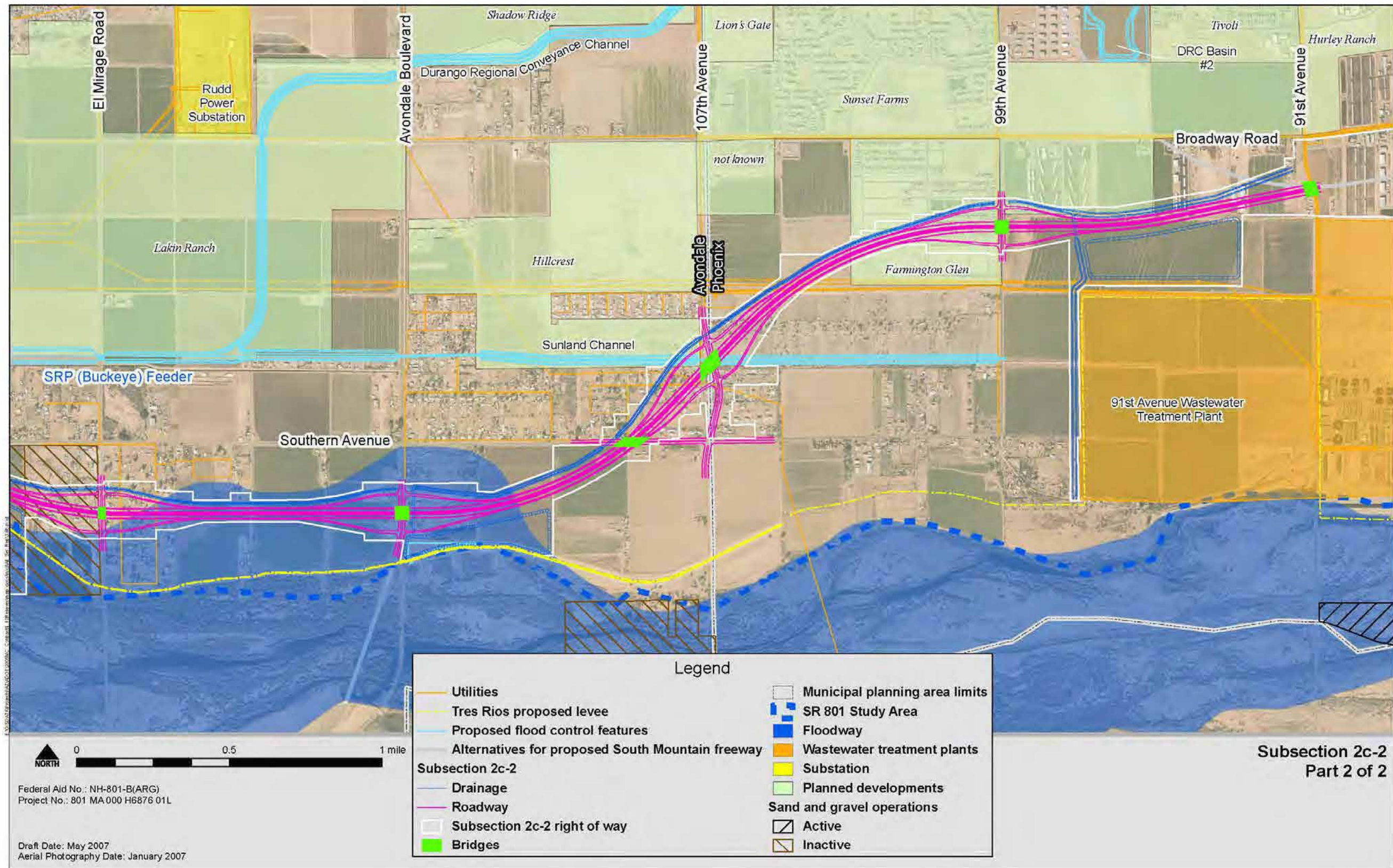
#### Adverse Issues:

1. The construction cost for this layout is approximately \$184 million more than the cheapest Section 2 layout, which is 2a-2. This is primarily because the Agua Fria River bridge is assumed to cross both the Agua Fria River and the DRCC Basin No. 1, making it an extremely long bridge and because this option has two additional bridges crossing Southern Avenue. In addition, major utility adjustments and additional roadway length (this layout is about ½ mile longer than 2a-2) contribute to the additional cost.

2. The right-of-way cost for this layout is about \$77 million more than the cheapest Section 2 right-of-way cost (for layout 2b-2), making it the most expensive right-of-way cost layout. This additional cost results from the longer roadway length and the 200 additional residential displacements.
3. The roadway geometry for this layout is less direct.
4. This layout affects four past, current, or planned sand and gravel operations. Right-of-way costs and economic impacts are being evaluated to quantify this impact.
5. The proximity of this layout to the Gila River and the Tres Rios project creates some substantial drainage challenges, both in terms of flood control and water quality.
6. The alignment crosses the APS pipeline in the Agua Fria River bottom. The bridge piers would need to be designed to avoid this facility.
7. At approximately 103rd Avenue, the freeway crosses over the 114-inch APS effluent pipeline. While not physically in conflict, the pipeline would have to be encased for approximately 700 feet, costing about \$2.7 million.
8. At the Dysart Road TI, the Buckeye Feeder Canal would need to be relocated through the interchange on a different alignment.
9. Because of the proximity to the Agua Fria River, the Gila River and the Tres Rios project, numerous environmental concerns exist. These include elevated noise levels within the wildlife habitat and a high potential for floodplain and jurisdictional water impacts.
10. Two high-risk hazardous material sites would be affected along Southern Avenue.
11. The historic St. Johns Canal is a small lined ditch located along the south side of Southern Avenue. It would be crossed at two locations. This canal would be afforded Section 4(f) protection. Impacts to this canal would have to be avoided if possible.
12. Visual impacts would be the greatest because the river and mountain views along the river are currently unobstructed by manmade elements.
13. The probability of environmental justice issues would be greatest with this layout because it affects more homes than the other Section 2 options and because the homes being affected, primarily along the Gila River, are more likely to fall within the environmental justice categories.
14. This layout affects a large number of acres with known prehistoric sites.
15. Coordination with FCDMC regarding the Bullard Wash, the proposed DRCC Basin No. 1, and the Sunland Channel would be essential.
16. Coordination would be required with FCDMC, the U.S. Army Corps of Engineers, and the City of Phoenix for the drainage outfalls through the Tres Rios Levee between Dysart Road and 107th Avenue.

Figure 3.9 – Subsection 2c-2 Layout





### Subsection 2c-3 Layout

**Background:** Subsection 2c-3 was developed in response to feedback from the City of Avondale regarding concerns about the other Section 2 layouts. This layout improves certain aspects of the other 2c layouts, such as avoiding the DRCC Basin No. 1.

**Description:** Subsection 2c-3 is approximately 8.7 miles long and is shown in Figure 3.10. Its limits extend from Estrella Parkway approximately 1,500 feet south of MC 85 to 91st Avenue approximately 1,000 feet south of Broadway Road. Beginning at the west end, the alignment heads east between Estrella Parkway and Bullard Avenue. At Bullard Avenue, it turns southeast across the Agua Fria River to approximately midway between Litchfield Road and Dysart Road, 300 feet south of Southern Avenue. At this point, it meanders north and south along an easterly alignment until it reaches El Mirage Road, where it crosses about 1,200 feet south of Southern Avenue. Between El Mirage Road and 107th Avenue, the freeway parallels Southern Avenue heading east. At 107th Avenue, the alignment turns northeast until it intersects 99th Avenue about 3,000 feet south of Broadway Road. Just east of 99th Avenue, the alignment turns east where it crosses 91st Avenue approximately 1,000 feet south of Broadway Road. Interchanges are proposed at Estrella Parkway, Bullard Avenue, Dysart Road, El Mirage Road, Avondale Boulevard, and 107th Avenue. Overpass bridges are required at each of these interchanges and where the freeway crosses the Bullard Wash, the Agua Fria River, and Southern Avenue between 107th Avenue and 99th Avenue.

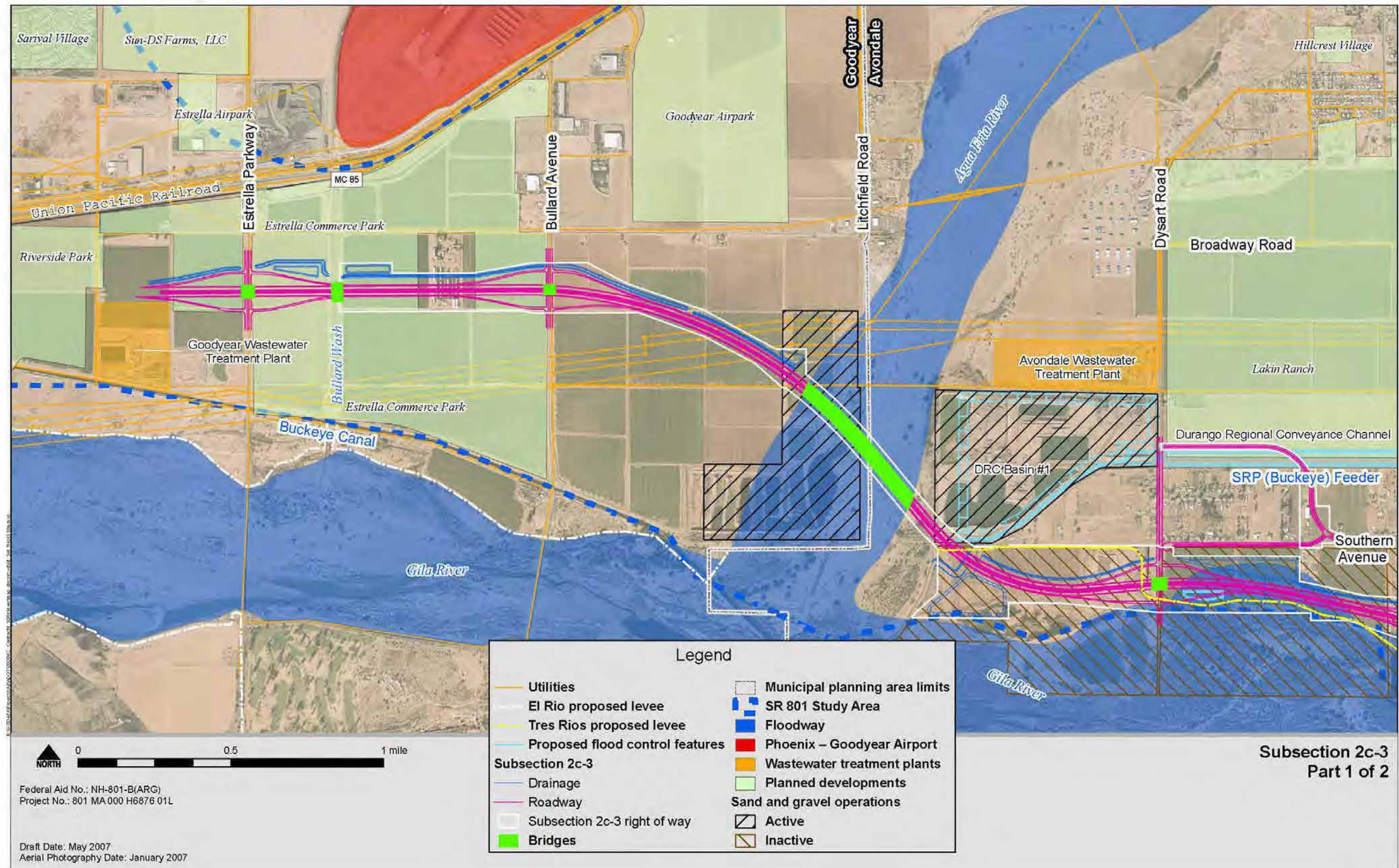
On- and off-site drainage would be conveyed through channels primarily along the north embankment. All drainage between Estrella Parkway and ½ mile east of Bullard Avenue would drain toward the Bullard Wash. From Bullard Avenue to Dysart Road, all drainage would drain toward the Agua Fria River. Between Dysart Road and Avondale Boulevard, the drainage would outfall under the freeway and through the Tres Rios Levee approximately ½ mile west of El Mirage Road. Between Avondale Boulevard and 99th Avenue, the drainage would outfall under the freeway approximately ¼ mile east of Avondale Boulevard through the Tres Rios Levee. East of 99th Avenue, drainage would flow west and discharge to the Salt River via the 97th Avenue alignment (about ¼ mile east of 99th Avenue). Because of the potential problems with a river outfall, in-line basins are assumed along the north side of the freeway to meter the flows and to assist with water quality, if warranted. At about a quarter mile east of 107th Avenue, the proposed Sunland Channel would cross the freeway. A realignment of the Sunland Channel under and around the 107th Avenue TI is being proposed; however, because this freeway would intercept most of the flows that would enter the Sunland Channel east of this crossing, it may be found that the Sunland Channel would be truncated on the west side of the freeway and no crossing would be needed at this location. As an alternative design, the freeway channel from 107th Avenue east could outfall into the Sunland Channel, significantly decreasing the flows that would enter the Salt River south of the Sunland Channel.

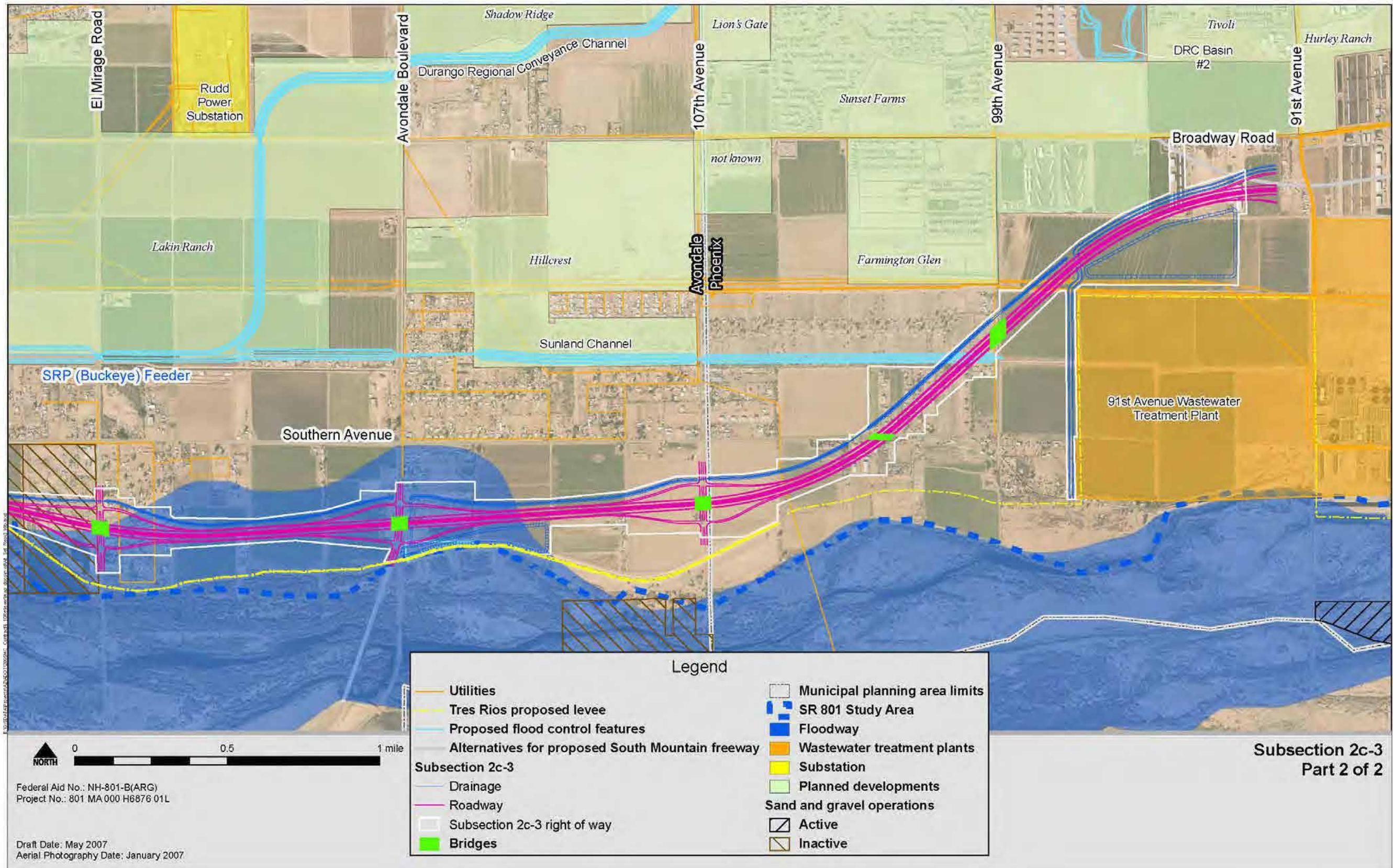
#### Adverse Issues:

1. The construction cost for this layout is approximately \$82 million more than the cheapest Section 2 layout, which is 2a-2. This is primarily because 2c-3 is about 0.7 mile longer than 2a-2 and has one additional bridge crossing Southern Avenue. In addition, the Agua Fria River bridge, while shorter than the other 2c layouts, is still much longer than the 2a-2 layout.
2. The right-of-way cost for this layout is about \$58 million more than the cheapest Section 2 right-of-way cost, which is for option 2b-2. This additional cost is due to the longer roadway length and the 200 additional residential displacements.

3. This layout affects four past, current, or planned sand and gravel operations. Right-of-way costs and economic impacts are being evaluated to quantify this impact.
4. The roadway geometry for this layout is less direct.
5. The proximity of this layout to the Gila River and the Tres Rios project creates some substantial drainage challenges, both in terms of flood control and water quality.
6. The alignment crosses the APS pipeline in the Agua Fria River bottom. The bridge piers would need to be designed to avoid this facility.
7. East of 99<sup>th</sup> Avenue, the freeway crosses over the APS pipeline. While not physically in conflict, the pipeline would have to be encased for approximately 950 feet, costing about \$3.7 million.
8. At the Dysart Road TI, the Buckeye Feeder Canal would need to be relocated through the interchange on a different alignment.
9. Because of the proximity to the Agua Fria River, the Gila River and the Tres Rios project, numerous environmental concerns exist. These include elevated noise levels within the wildlife habitat and a high potential for floodplain and jurisdictional water impacts.
10. Two high-risk hazardous material sites would be affected along Southern Avenue.
11. The historic St. Johns Canal is a small lined ditch located along the south side of Southern Avenue. It would be crossed at two locations. This canal would be afforded Section 4(f) protection. Impacts to this canal would have to be avoided if possible.
12. Visual impacts would be the greatest because the river and mountain views along the river are currently unobstructed by manmade elements.
13. Coordination with FCDMC regarding the Bullard Wash, the proposed DRCC Basin No. 1, and the Sunland Channel would be essential.
14. Impacts the Tres Rios levee between the Agua Fria River and Dysart Road. Reconstruction of the levee will be required.
15. Coordination would be required with FCDMC, the U.S. Army Corps of Engineers, and the City of Phoenix for the drainage outfalls through the Tres Rios Levee between Dysart Road and 107th Avenue.

Figure 3.10 – Subsection 2c-3 Layout







### Subsection 3a Layout

**Description:** Subsection 3a is 3.3 miles long and is shown in Figure 3.11. It begins approximately 1,000 feet south of the 91st Avenue/Broadway Road intersection on the west and ends at approximately 61st Avenue and Broadway Road. Beginning at the west end, the alignment immediately turns northeast crossing Broadway Road at a high skew. The alignment then turns due east, running parallel to and approximately 1,000 feet north of Broadway Road. After crossing 67th Avenue, the alignment sweeps east-southeast where it intersects the proposed W55 South Mountain Freeway (SR 202L) alignment. The alignment is elevated throughout this subsection because of the number and sizes of various utilities along the crossroads (many of which are gravity systems) and the shallow depth of groundwater in the area. This subsection requires bridges at 91st Avenue, Broadway Road, 83rd Avenue, 75th Avenue, and 67th Avenue. Additional bridges are required within the SR 801/SR 202L interchange.

On- and off-site drainage would be conveyed through channels along the north freeway embankment. Drainage west of SR 202L to 99th Avenue would flow toward 99th Avenue passing under Broadway Road. This drainage system would flow to the Section 2 system, where it would outfall to the Salt River at 97th Avenue.

It should be noted that this description only includes the W55 SR 202L alignment alternative. The discussion would be similar for the W71 SR 202L alignment, except that everything east of 71st Avenue would be truncated. If either of the W101W, W101C, or W101E SR 202L alignments were chosen, this entire subsection would be virtually eliminated.

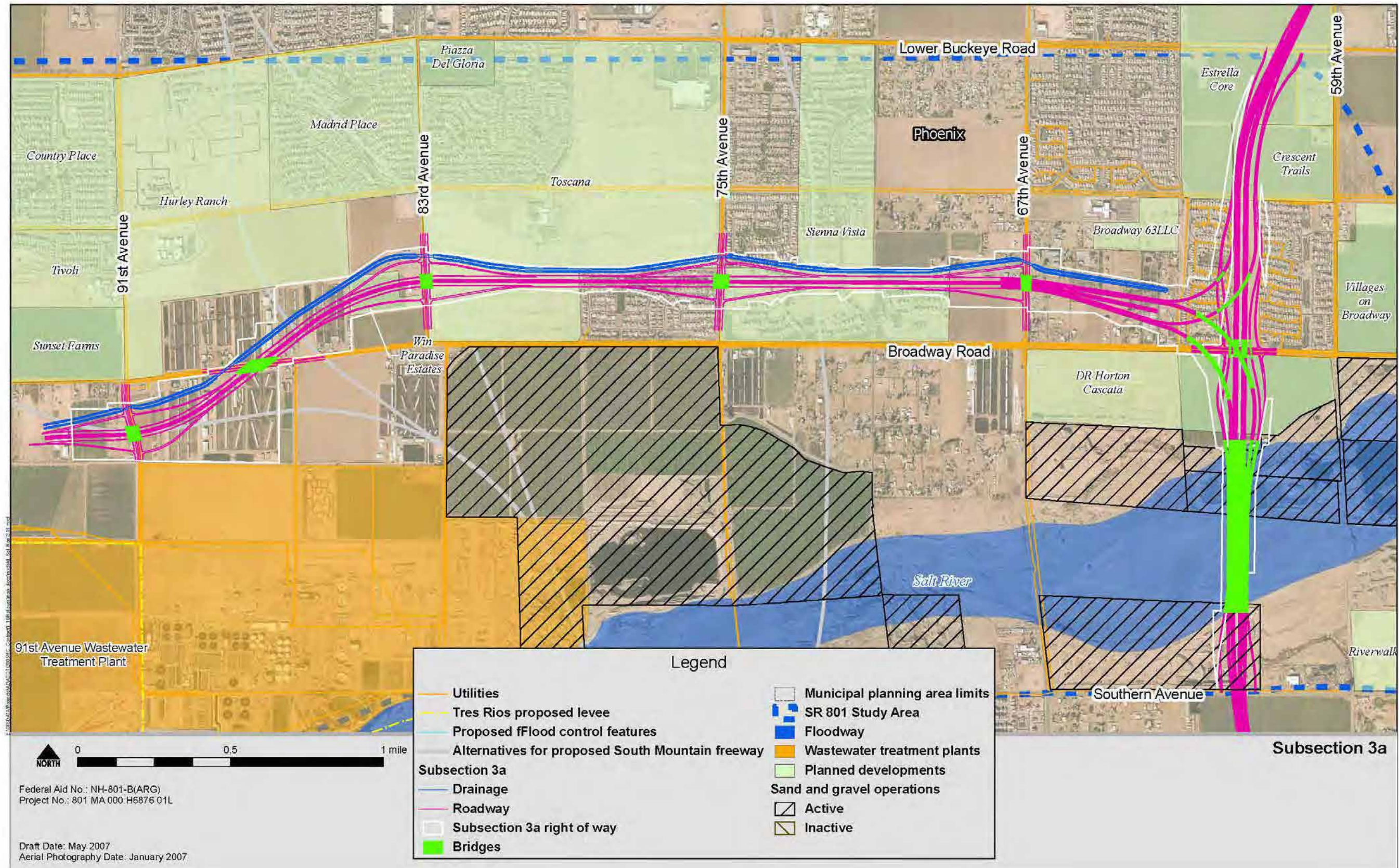
#### Adverse Issues:

1. This layout falls entirely within the City of Phoenix and has no community support from the City of Phoenix because of the significant number of impacts to existing development.
2. The construction cost for this layout is approximately \$15 million more than the other Section 3 layout, which is 3b. This is primarily because 3a is slightly longer and must cross Broadway Road, adding another bridge.
3. The right-of-way cost for this layout is about \$100 million more than 3b. This additional cost is primarily due to the significantly higher residential relocations required for this subsection.
4. The geometry for Subsection 3a is "forced," as demonstrated with the mile-long "S" curve on the west end and the southerly jog on the east end. This is less desirable when compared with Subsection 3b.
5. At the SR 202L connection, provisions for a future through connection to the Avenida Rio Salado project are very challenging because this future connection would have to cross Broadway Road.
6. A gravity storm drain system under Broadway Road may be very challenging, given the significant number of gravity sanitary sewer pipes under Broadway Road that serve the 91st Avenue WWTP.
7. Overhead power relocations would be needed along 91st Avenue (69 kV facility) and Broadway Road (230 kV facility).
8. Noise impacts on existing residential neighborhoods would be higher.
9. One high-risk hazardous material site would be affected.

10. SRP's Lateral 19.0, a historic and Section 4(f) feature, would be crossed.

11. The probability of environmental justice issues would be greater than for 3b because of the large residential neighborhood impacts.

Figure 3.11 – Subsection 3a Layout



### Subsection 3b Layout

**Description:** Subsection 3b is approximately 3.1 miles long and is shown in Figure 3.12. It begins approximately 1,000 feet south of the 91st Avenue/Broadway Road intersection on the west and ends at approximately 1,000 feet south of 61st Avenue and Broadway Road. The alignment runs generally east-west paralleling Broadway Road to the south. The east end terminates in a directional interchange with the proposed W55 South Mountain Freeway (SR 202L) alignment. The alignment is elevated throughout this subsection because of the number and sizes of various utilities along the crossroads (many of which are gravity systems) and the shallow depth of groundwater in the area. This subsection requires bridges at 91st Avenue, 83rd Avenue, 75th Avenue, and 67th Avenue. Additional bridges are required within the SR 801/SR 202L interchange.

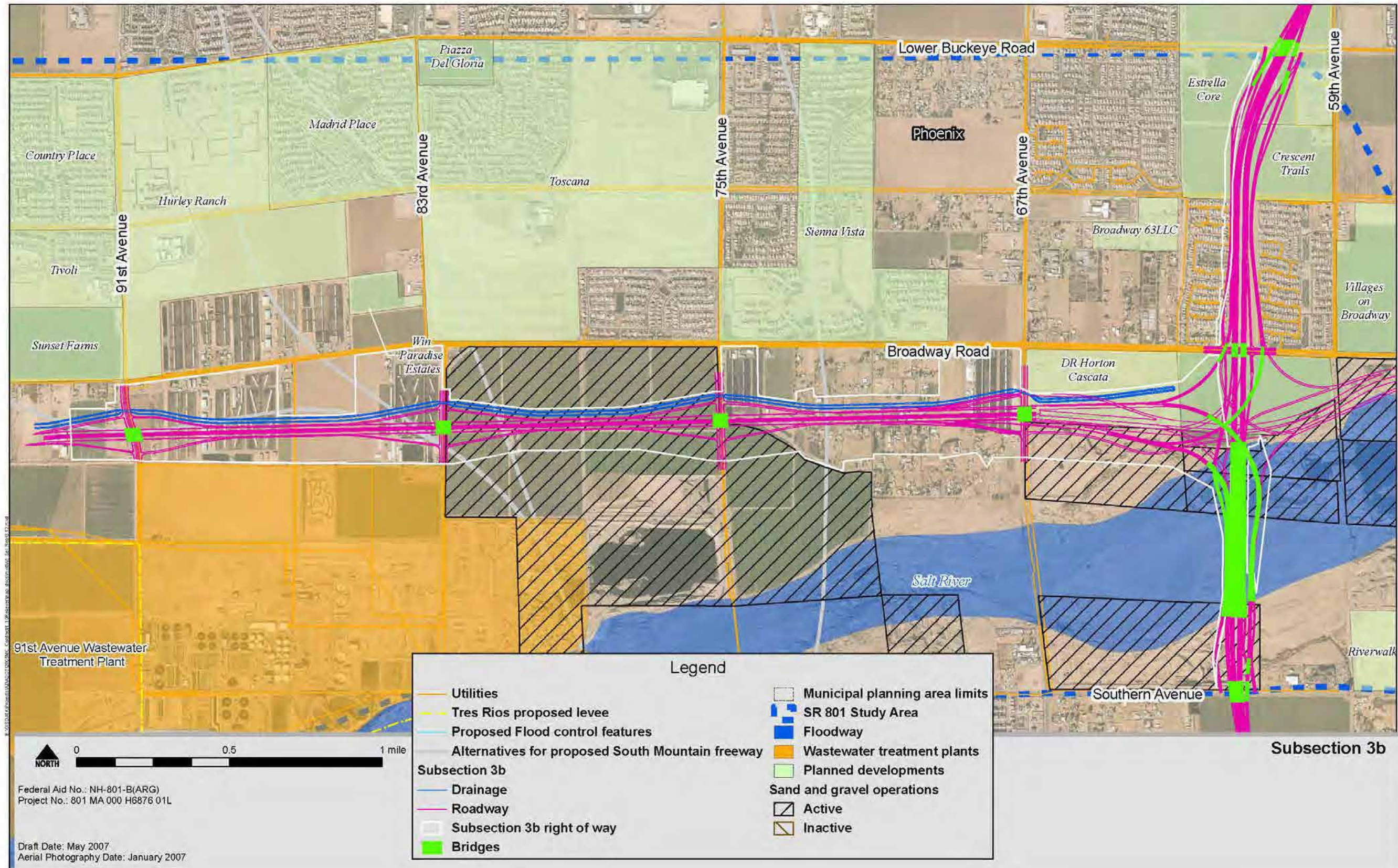
On- and off-site drainage would be conveyed through channels along the north embankment. Drainage west of SR 202L to 99th Avenue would flow toward 99th Avenue. This drainage system would flow to the Section 2 system, where it would outfall to the Salt River at 97th Avenue.

It should be noted that this description only includes the W55 SR 202L alignment alternative. The discussion would be similar for the W71 SR 202L alignment, except that everything east of 71st Avenue would be truncated. If either of the W101W, W101C, or W101E SR 202L alignments were chosen, this entire subsection would be virtually eliminated.

#### Adverse Issues:

1. Because of the proximity to the Salt River (compared with layout 3a), numerous environmental concerns exist. These include elevated noise levels within the wildlife habitat and a higher potential for floodplain and jurisdictional water impacts.
2. This layout affects a large number of acres with known prehistoric sites.
3. This layout affects two sand and gravel operations. Right-of-way costs and economic impacts are being evaluated to quantify this impact.
4. Compared with Subsection 3a, a slightly larger area of disturbance to the Salt River would occur because of additional bridges that would be needed within the SR 801/SR 202L TI.
5. Overhead power relocations would be needed along 91st Avenue (69 kV facility) and 83rd Avenue (69 kV facility).
6. Two major sewer pipes feeding the 91st Avenue WWTP would cross under the freeway embankment at 87th Avenue. These pipes would likely need to be encased or spanned with bridges to avoid overloading the pipes.
7. This layout requires the SR 801/SR 202L TI to fall more within the Salt River. As a result, many more bridges are required to accommodate the system interchange.

Figure 3.12 – Subsection 3b Layout



## Depressed Profile Subsection Layouts

**Background:** Several of the layouts described above reference interchange locations where overhead power line relocations are necessary to construct an elevated interchange. As a result, a depressed interchange was developed and evaluated at each of these locations. These locations were as follows:

- El Mirage Road (2a-1)
- El Mirage Road (2a-2)
- Bullard Avenue (2b-1)
- El Mirage Road (2b-2)
- Bullard Avenue and 99th Avenue (2c-1)

Numerous technical challenges were encountered with each of these depressed mainlines.

### Major Issues:

1. *APS PVNGS Pipeline Relocations* – At the Bullard Avenue and 99th Avenue locations, the depressed mainline would sever the APS pipeline. Any relocation of this facility would be strongly opposed by Palo Verde because this line is the plant's sole source of cooling water. Its relocation would be extremely expensive and Palo Verde has never approved a relocation of this facility in the past. National security implications would be likely.
2. *Shallow Groundwater* – The entire SR 801 Study Area has extremely shallow groundwater because of its proximity to the Agua Fria, Salt, and Gila rivers. Historical records indicate that groundwater depths in this area range from 5 to 35 feet below ground surface (please refer to Appendix D for additional information). Furthermore, as the Study Area transitions from agricultural to residential land uses, the groundwater pumping would likely decrease, which would likely cause the groundwater levels to rise even further. Options were evaluated to construct a depressed roadway within an area of shallow groundwater, but these options are generally undesirable for the following reasons:
  - Dewatering system maintenance – this system would be intensive to operate and maintain; it would have to function continuously.
  - Dewatering system outfall – once the water is pumped out of the ground, it must be discharged somewhere. The likely location is the nearby rivers, but this causes additional problems from an environmental and flood control standpoint.
  - Groundwater quality – once the water is pumped out of the ground, ADOT would be responsible for the water quality. Treatment might be required before it can be discharged to the rivers.
  - Groundwater dewatering “cone of influence” – pumping groundwater continuously would cause the water table to draw down in an inverted cone-like shape. This shape would likely extend outside the limits of ADOT's right-of-way. This would be considered an impact to adjacent properties, particularly for those that currently have wells.
  - Subsidence – continuous dewatering might result in ground subsidence within the cone of influence, which might extend outside of the ADOT right-of-way. ADOT would likely be liable for any damages to the adjacent properties and structures arising from this subsidence.
3. *On-Site Drainage* – Because the low point of the mainline profiles would likely be below the level of the rivers, pump stations would be required to drain the freeway during storm events at the sag points.

While not unusual, these result in additional costs and long-term operations and maintenance responsibilities.

4. *Costs* – Depressed interchange options would cost more to construct because of the addition of pump stations, dewatering systems, and, in some cases, relocations of underground utilities within the depressed footprint. However, some of these costs are offset by the reduction in the borrow requirements and the elimination of overhead power line relocations.

While these depressed profile options were developed and evaluated, they are not presented in any additional detail. The Study Team agreed that these options were not feasible and were removed from further consideration because other options existed that avoided the need for depressed profiles.

## 3.3 SR 801/SR 303L Interchange Concept Study Findings

**Background:** Section 1 presented some unique challenges during the evaluation process as related to providing a logical terminus for the project. The Section 1 subsections would connect to the proposed SR 303L freeway to the north (which has not yet been defined), the future SR 801 extension to the west to SR 85 (which also has not yet been defined), and the future SR 303L extension to the south over the Gila River (which had only preliminarily been sited in 2004 by a MCDOT study). It became impossible to conclude whether Subsection 1a or 1b could be removed because it was not clear how SR 801 and SR 303L would ultimately interconnect. As a result, an engineering study was conducted to develop and evaluate concept configurations for this connection and to determine whether Subsection 1a or 1b could be removed from further consideration. The details of this study are included in Appendix F.

**Findings:** At the conclusion of this month-long study, the Study Team (including ADOT and FHWA) concluded that the study demonstrated that no feasible concepts using the Subsection 1a layout exist. When combined with the findings documented in Section 3.4 of this report, it was agreed that Subsection 1a should be removed from further consideration from the SR 801 (SR 303L to SR 202L) project.

## 3.4 Subsection Layout Evaluation

On February 14, 2007, the Study Team presented the findings of the subsection evaluation to ADOT management and FHWA. Figure 3.13 illustrates all 11 subsection layouts evaluated and Table 3.1 summarizes findings of the analysis. This table lists the subsections across the top and the evaluation criteria down the left side. The table uses red, green, and white to graphically show the relative scoring of each criterion. Red identifies the less desirable options, green identifies the more desirable options, and white falls somewhere in between or represents an insignificant differentiator. Each subsection is only compared with the other subsections within its respective section. For instance, 1a is only compared with 1b for each criterion. It should be noted that all criteria are not weighted the same. Therefore, one cannot simply count the green and red boxes in each subsection and make a selection. Rather, the reader should look for general trends in the colors.

As noted previously in this report, five additional layout options were evaluated that used depressed profiles at specific interchanges. These five layouts are not included in Table 3.1 because they were removed from further consideration prior to the development of the evaluation matrix.

**Evaluation Criteria:**

Thirty-three specific criteria were evaluated and grouped into four major categories. In no specific order, these categories and criteria are described below:

1. Cost and right-of-way
  - a) Relative construction cost (shown as delta cost compared to the cheapest "base" cost)
  - b) Relative right-of-way cost (shown as delta cost compared to the cheapest "base" cost)
  - c) Net right-of-way acreage
  - d) Residential displacements (existing)
  - e) Residential displacements (platted)
  - f) Business displacements
  - g) Dairy displacements
  - h) Planned school impacts
  - i) Past, current and planned sand and gravel operation impacts
2. Community support
  - a) Goodyear community support
  - b) Avondale community support
  - c) Phoenix community support
  - d) Maricopa County community support
3. Engineering
  - a) Geometric design
  - b) Drainage implications
  - c) Traffic operations
  - d) Major utility impacts
  - e) Maintenance issues
4. Environmental
  - a) Prime and unique farmlands
  - b) Biology impacts – critical habitat vegetation
  - c) Biology impacts – wildlife (threatened, endangered, candidate, and species of concern)
  - d) Floodplain impacts
  - e) Jurisdictional waters impacts
  - f) Water resource impacts
  - g) Relative noise impacts (based on existing land use compared with the build condition)
  - h) Air quality
  - i) Visual assessment
  - j) Hazardous materials impacts
  - k) Section 4(f) elements
  - l) Environmental justice population impacts
  - m) Planned development impacts
  - n) Cultural resources (historic) site impacts
  - o) Cultural resources (prehistoric) site impacts

For a detailed breakdown of construction costs, please refer to Appendix E. For a breakdown of right-of-way acquisition costs, refer to Section 2.2 of this report.

Figure 3.13 – Subsections Evaluated

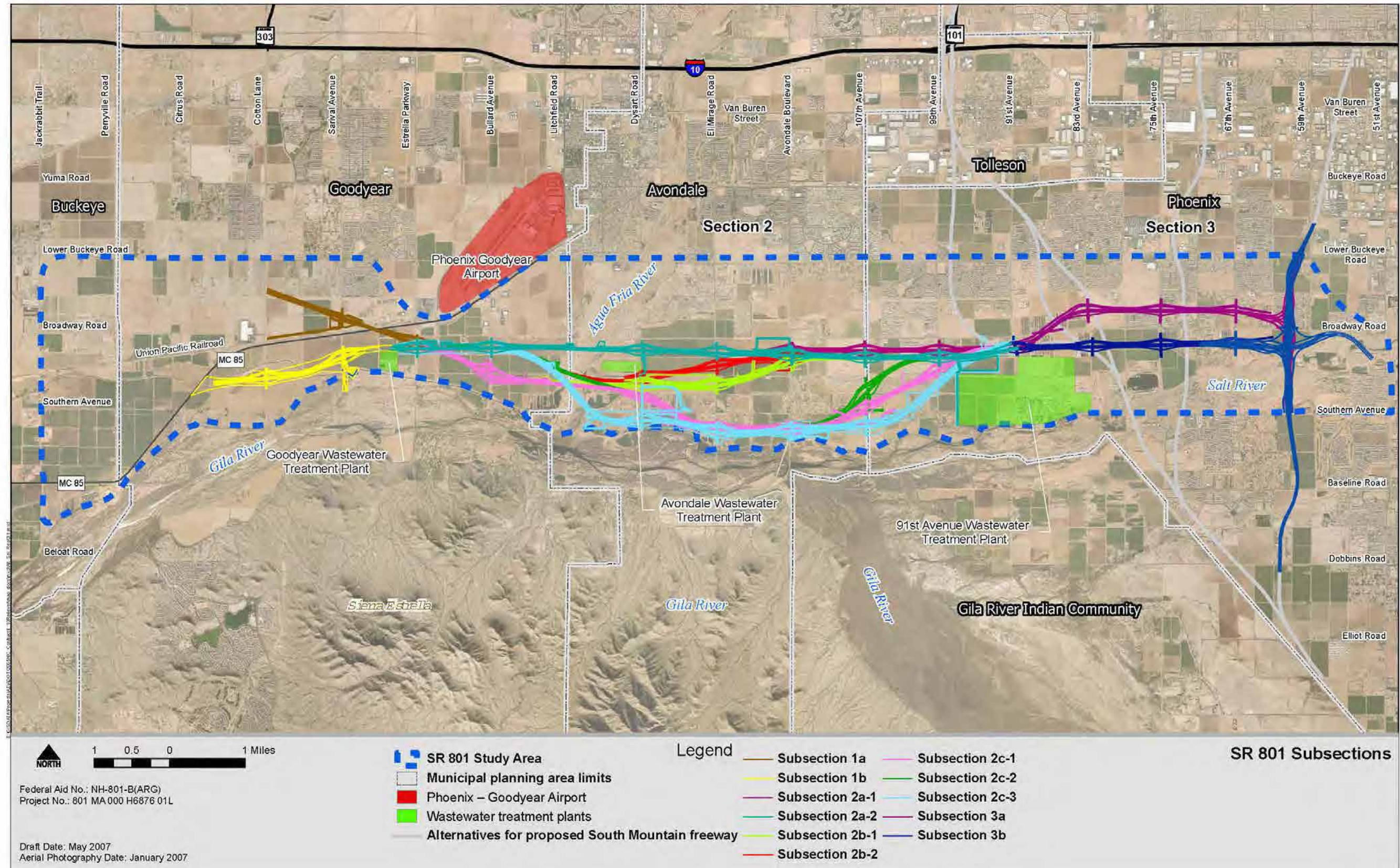


Table 3.1 – Evaluation Matrix for Subsections

SR 801 (LOOP 303 TO LOOP 202)  
SUBSECTION COMPARISON

SECTION SUBSECTION	SECTION 1		SECTION 2						SECTION 3	
	1a	1b	2a-1	2a-2	2b-1	2b-2	2c-1	2c-2	2c-3	3a

SR 801 (LOOP 303 TO LOOP 202)  
SUBSECTION COMPARISON

SECTION SUBSECTION	SECTION 1		SECTION 2						SECTION 3		
	1a	1b	2a-1	2a-2	2b-1	2b-2	2c-1	2c-2	2c-3	3a	3b
Maintenance Issues	Moderate due to UPRR / MC 85 bridge and drainage solution north of UPRR. Possibly two pumpstations needed.	Minor. Shortest Length and only 1 pumpstations.	Nothing unusual or unique. Shortest Length	Nothing unusual or unique. Shortest Length	Nothing unusual or unique. Second shortest Length	Nothing unusual or unique. Second shortest Length	Moderate. Length is ~0.4 miles longer.	Moderate. Length is ~0.5 miles longer.	Moderate. Length is ~0.6 miles longer.	Possibly Undesirable: Storm drain siphon(s) may be needed at Broadway.	Nothing unusual or unique.
<b>ENVIRONMENTAL</b>											
Prime & Unique Farmlands (Acres)	112.7	141.1	714.2	657.9	727	639.1	663.1	589.2	665	238.8	397.7
Biology Impacts - Critical Habitat Vegetation	None	None	None	None	Possible Wetland impacts at Avondale WWTP outfall	Possible Wetland impacts at Avondale WWTP outfall	Possible Wetland impacts at Avondale WWTP outfall	Possible Wetland impacts at Avondale WWTP outfall	None	None	None
Biology Impacts - Wildlife (Threatened, Endangered & Species of Concern)	None anticipated.	Elevated Noise levels, air quality adjacent to Gila River Habitat	Elevated Noise levels, air quality adjacent to Agua Fria River Habitat	Elevated Noise levels, air quality adjacent to Agua Fria River Habitat	Elevated Noise levels, air quality adjacent to Agua Fria River Habitat	Elevated Noise levels, air quality adjacent to Agua Fria River Habitat	Elevated Noise levels, air quality adjacent to Agua Fria, Salt and Gila River Habitats	Elevated Noise levels, air quality adjacent to Agua Fria, Salt and Gila River Habitats	Elevated Noise levels, air quality adjacent to Agua Fria, Salt and Gila River Habitats	None anticipated.	Elevated Noise levels, air quality adjacent to Salt River Habitat
Floodplain Impacts (Acres)	0	3.5	17.4	17.4	27.6	24.2	255.8	238.9	246.5	16.4	21.1
Jurisdictional Waters Impact (Acres)	0	1.9	3.4	3.4	6.3	6	6.7	5.9	3.7	16.9	22
Water Resource Impacts	5 wells	48 wells & BWCDD Crossing	24 Wells, Agua Fria River (0.7 Ac.), Bullard Wash & Buckeye Feeder	24 Wells, Agua Fria River (0.7 Ac.), Bullard Wash & Buckeye Feeder	28 Wells, Agua Fria River (1.1 Ac.), Bullard Wash, Wetlands & Buckeye Feeder	28 Wells, Agua Fria River (0.9 Ac.), Bullard Wash, Wetlands & Buckeye Feeder	82 Wells, Agua Fria River (1.6 Ac.), Bullard Wash, Wetlands, Buckeye Feeder & St. John's Canal	82 Wells, Agua Fria River (1.0 Ac.), Bullard Wash, Wetlands, Buckeye Feeder & St. John's Canal	82 Wells, Agua Fria River (1.1 Ac.), Bullard Wash, Buckeye Feeder & St. John's Canal	32 Wells & Salt River (16.9 Ac.)	16 Wells & Salt River (21.9 Ac.)
Relative Noise Impacts (Exist Conditions)	N/A	N/A	Low	Low	Moderate	Moderate	High	High	High	High	Moderate
Air Quality	Conformance Compliant	Conformance Compliant	Conformance Compliant	Conformance Compliant	Conformance Compliant	Conformance Compliant	Conformance Compliant	Conformance Compliant	Conformance Compliant	Conformance Compliant	Conformance Compliant
Visual (Quality Rating, Higher = Better)	3.7	3 - Due to proximity to River & Mountains	3.7	3.7	3.4	3.4	2.8 - Due to proximity to River & Mountains	2.8 - Due to proximity to River & Mountains	2.8 - Due to proximity to River & Mountains	3.4 - Due to proximity to existing housing	3.7
Possible Hazardous Material Impacts	4 low level sites	1 low level site	2 low level sites	2 low level sites	0	0	2 high level sites	2 high level sites	2 high level sites	1 high level site	1 low level site
Section 4(f) Element Impacts	UPRR & 2 Trails - Will be spanned	Buckeye Canal - Will be spanned	3 Trails - Will be spanned	3 Trails - Will be spanned	3 Trai's - Will be spanned	3 Trails - Will be spanned	3 Trails (will be spanned), St. Johns Canal, Everett Dairy, Southern Ave Dairy	3 Trails (will be spanned), St. Johns Canal, Southern Ave Dairy	3 Trails (will be spanned), St. Johns Canal, Southern Ave Dairy	SRP Lateral 19, 1 Trail, 1 Trail (will be spanned)	1 Trail (will be spanned)
Environmental Justice - Probability of Impacts - (Disabled, Age 65 & Older, Minority, Poverty & Female HOH). Response based on number of residential displacements noted above.	Low	Low	Low	Low	Low	Low	High	High	Moderate	Very High	Moderate
Planned Development Impacts (Acres)	78.97	123.28	438.37	392.22	416.83	386.61	117.06	137.83	6.44	117.87	61.44
Cultural Resources (Historic) Site Impacts	UPRR - Will be spanned	Buckeye Canal - Will be spanned	Site AZ T:11:42 (ASM)	Site AZ T:11:42 (ASM)	Site AZ T:11:42 (ASM)	Site AZ T:11:42 (ASM)	St. Johns Canal, Everett Dairy, Southern Ave. Dairy	St. Johns Canal, Southern Ave. Dairy	St. Johns Canal	Lateral 19.0	None
Cultural Resources (Prehistoric) Impacts (Acres)	3.17	27.56	146.38	122.33	111.23	110.94	61.17	130.2	12.05	11.47	32.9
<b>GENERAL STATISTICS</b>											
Length (mi.)	1.81	1.78	8.06	8.07	8.21	8.16	8.49	8.57	8.72	3.26	3.14
Number of Service TI's	1	1	7	7	7	7	7	7	6	3.5	3.5
Borrow Requirements (CY)	1.0M	0.9M	2.3M	2.0M	2.2M	3.1M	3.5M	3.6M	4.4M	1.1M	0.9M
Bridge Deck Area (SF)	283,000	83,564	734,527	734,395	1,451,080	1,296,687	1,559,338	1,523,602	1,021,708	247,000	175,068
Number of Pump Stations	1 and possibly 2	1	0	0	0	0	0	0	0	0	0



## 4.0 Recommendations

### 4.1 Subsection Recommendations

**Section 1:** Table 3.1 indicates that Subsection 1b is superior to 1a. The predominant reasons for this are the technical challenges associated with crossing MC 85 and UPRR and the lack of local jurisdiction support for 1a. In addition, as noted previously, no feasible SR 801/SR 303L interchange connection using the 1a layout exists. The Study Team recommended dropping Subsection 1a from further consideration.

- **Section 1 Recommendation:** ADOT and FHWA concurred with the Study Team's recommendation to drop Subsection 1a from further consideration.

**Section 2:** Certain subsections exhibited highly undesirable attributes. For instance, Subsections 2c-1 and 2c-2 were recommended to be removed from further consideration because their cost is extremely high, drainage and utility issues are substantial, and environmental impacts were among the least desirable studied in Section 2. Subsections 2b-1 and 2b-2 were recommended to be removed from further consideration because they offered no advantages over Subsections 2a-1 and 2a-2 and because they had no local jurisdiction support. Subsections 2a-1 and 2a-2 are very similar, but 2a-2 is superior to 2a-1 because it facilitates better land use. Therefore, 2a-1 was recommended to be removed from further consideration. The Study Team recommended that 2a-2 and 2c-3 be carried forward. Subsection 2a-2 scored well in the cost, engineering, and environmental categories but lacked local jurisdiction support because of the impact to planned developments. Subsection 2c-3 has full local jurisdiction support, but ranked lower in the other categories, including potential impacts to sand and gravel operations along the riverbanks. With the data collected to date, the Study Team felt it was not possible to remove either 2a-2 or 2c-3 at this time.

- **Section 2 Recommendation:** ADOT and FHWA agreed with the Study Team's recommendations to remove Subsections 2a-1, 2b-1, 2b-2, 2c-1, and 2c-2 from further consideration. In addition, ADOT and FHWA agreed that it was premature to remove either 2a-2 or 2c-3 at this time. ADOT suggested that these two alignments be presented to the cities and the public and gather their input prior to making a decision. In addition, ADOT requested that the Study Team perform a detailed sand and gravel impact study in order to understand the risks and economic impacts associated with the southern alignment.

**Section 3:** Section 3 is relatively straightforward. Subsection 3b appears to be far superior to 3a for numerous reasons. Subsection 3b is cheaper, has local jurisdiction support, more desirable engineering traits, and is generally less of an impact to the environment. There is no compelling reason to choose Subsection 3a.

- **Section 3 Recommendation:** ADOT and FHWA concurred with the Study Team's recommendation to remove Subsection 3a from further consideration.

**No-Action Alternative:** As the name implies, the No-Action Alternative would not construct any improvements in the corridor. While not included in Table 3.1, the No-Action Alternative would not implement the improvements identified in the *Regional Transportation Plan* to reduce traffic congestion, encourage carpooling, and support planned bus rapid transit (BRT) and other express bus systems. The No-Action Alternative is also inconsistent with the three cities' general plans and fails to ease traffic

congestion on I-10. Consequently, this alternative would score poorly in the community support and traffic operations categories. It would, however, generally score favorably in the cost and environmental impacts categories.

- **No-Build Alternative Recommendation:** Within Section 2, the local jurisdictions fully supports the 2c-3 layout, while most other measurements favor the 2a-2 layout. Ultimately, a decision will have to be made between 2a-2, 2c-3, or the No-Action Alternative. Because this decision could be complicated, the Study Team recommends carrying the No-Build Alternative forward in the event that a build decision that satisfies all the stakeholders cannot be reached.

### 4.2 Alternatives to Carry Forward

As a result of the subsection evaluation process, four build subsections and the no-build alternative will be carried forward to the L/DCR and the Draft EA. Subsections 1b, 2a-2, 2c-3, and 3b are recommended for further study. The No-Action Alternative will also be carried forward. The four build subsections can be combined to create two complete build alignments:

- 1b, 2a-2, 3b = North Alternative
- 1b, 2c-3, 3b = South Alternative

These two remaining build alternatives are shown in Figure 4.1. Table 4.1 compares the two complete build alternatives using the same criteria noted in Section 3.4. Table 4.1 uses the same color-coding used in Table 3.1. It can be observed from Table 4.1 that the North Alternative contains several green-colored features, but lacks the community support because of the impacts to the planned development in Avondale. The South Alternative has the community support, but is less desirable in other categories. Ultimately, the decision that will need to be made is whether the trade off in additional cost and additional impacts to existing homes in the South Alternative is worth the impacts to the planned developments in the North Alternative.

The L/DCR document and the Draft EA will carry the North Alternative, the South Alternative, and the No-Build Alternative forward and will document the process to select a preferred alternative.

Figure 4.1 – North and South Alternatives to Carry Forward

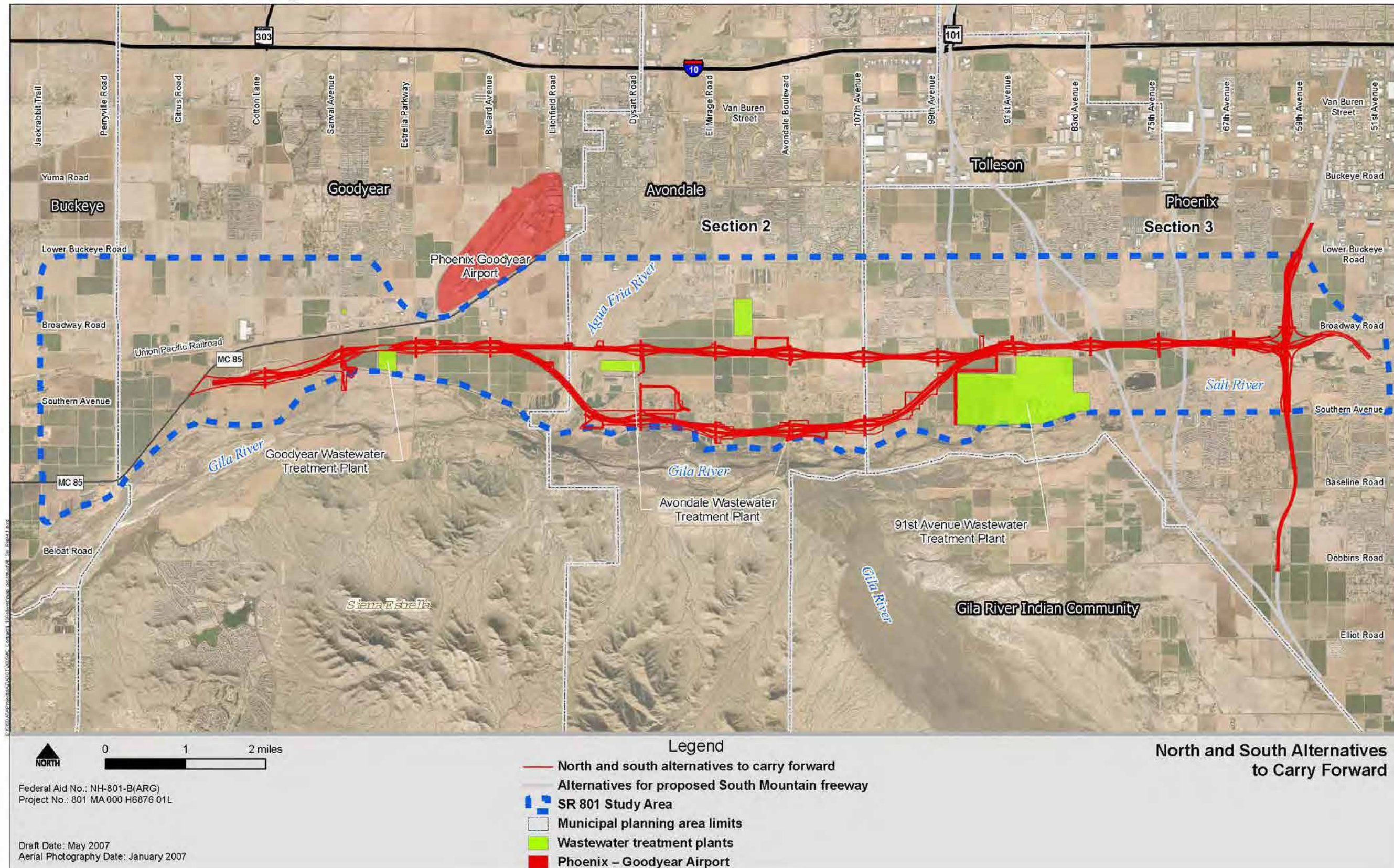


Table 4.1 – Evaluation Matrix for North and South Alternatives

**SR 801 (SR 303L to SR 202L)  
ALIGNMENTS TO CARRY FORWARD**

ALIGNMENT	NORTH	SOUTH
<b>COST AND RIGHT OF WAY</b>		
Relative Construction Cost	Base	Base + \$82M
Relative Right of Way Cost	Base	Base + \$54M
Net Right of Way Acreage	1165	1333
Residential Displacements (Existing)	90	276
Residential Displacements (Platted)	366	16
Business Displacements	2	1
Dairy Displacements	4	3
Planned School Impacts	3	0
Past, Current & Planned Sand & Gravel Operation Impacts (Acres)	61	337 (This number could increase as more properties along the river are purchased for this purpose)
<b>COMMUNITY SUPPORT</b>		
Goodyear Community Support	No	Supports Avondale
Avondale Community Support	No	Yes
Phoenix Community Support	No	Yes. Favored due to shielding of WWTP. City Council expected to voice support formally soon.
Maricopa County - Supervisor Mary Rose Wilcox	No	Yes
<b>ENGINEERING</b>		
Geometric Design	Desirable	Acceptable
Drainage Implications	Minor. Shortest River Xing. Must cross DRCC - Possible FCDMC Cost Share Opportunities	Substantial. Will be located immediately upstream of Tres Rios levee, impacting Tres Rios basins. Possible FCDMC cost share opportunities.
Traffic Operations	More efficient and balanced TI traffic utilization.	Less efficient and balanced TI traffic utilization.
Major Utility Impacts	Moderate 500 kV, 230 kV & 69 kV OHP relocations. Minor pipeline encasements.	Minor 69 kV OHP relocations. Minor irrigation impacts. Moderate pipeline encasements.
Maintenance Issues	Minor. Shortest Length and only 1 pumpstations.	Moderate. Length is ~ 0.6 miles longer than north option. 1 pumpstation.
<b>ENVIRONMENTAL</b>		
Prime & Unique Farmlands (Acres)	1196.7	1203.8
Biology Impacts - Critical Habitat Vegetation	None	None
Biology Impacts - Wildlife (Threatened, Endangered & Species of Concern)	Elevated Noise levels, air quality adjacent to Agua Fria, Salt and Gila River Habitats. Areas of concern will be less than south alignment.	Elevated Noise levels, air quality adjacent to Agua Fria, Salt and Gila River Habitats. Areas of concern will be more than north alignment.
Floodplain Impacts (Acres)	42	271.1
Jurisdictional Waters Impact (Acres)	27.3	27.6
Water Resource Impacts	88 Wells, BWCDD, Agua Fria River (0.7 Ac.), Bullard Wash, Buckeye Feeder & Salt River (21.9 Ac.)	146 Wells, BWCDD, Agua Fria River (1.1 Ac.), Bullard Wash, Buckeye Feeder, St. John's Canal & Salt River (21.9 Ac.)
Relative Noise Impacts (Exist Conditions)	Low	High
Air Quality	Conformance Compliant	Conformance Compliant
Visual (Quality Rating, Higher = Better)	3.7	2.8 - Due to proximity to River & Mountains
Possible Hazardous Material Impacts	4 low level sites	2 low level sites & 2 high level sites
Section 4(f) Element Impacts	Buckeye Canal & 4 Trails - all will be spanned.	Buckeye Canal & 4 trails - all will be spanned. St. John's Canal, Southern Ave Dairy
Environmental Justice - Probability of Impacts - (Disabled, Age 65 & Older, Minority, Poverty & Female HOH). Response based on number of residential displacements noted above.	Low	Moderate
Planned Development Impacts (Acres)	576.94	191.16
Cultural Resources (Historic) Site Impacts	Buckeye Canal, Site AZ T:11:42 (ASM)	Buckeye Canal, St. John's Canal and Southern Ave. Dairy
Cultural Resources (Prehistoric) Impacts (Acres)	182.79	72.51
<b>GENERAL STATISTICS</b>		
Length (mi.)	12.99	13.64
Number of Service TI's	11.5	10.5
Borrow Requirements (CY)	3.7M	6.1M
Bridge Deck Area (SF)	993,027	1,280,340
Number of Pump Stations	1	1

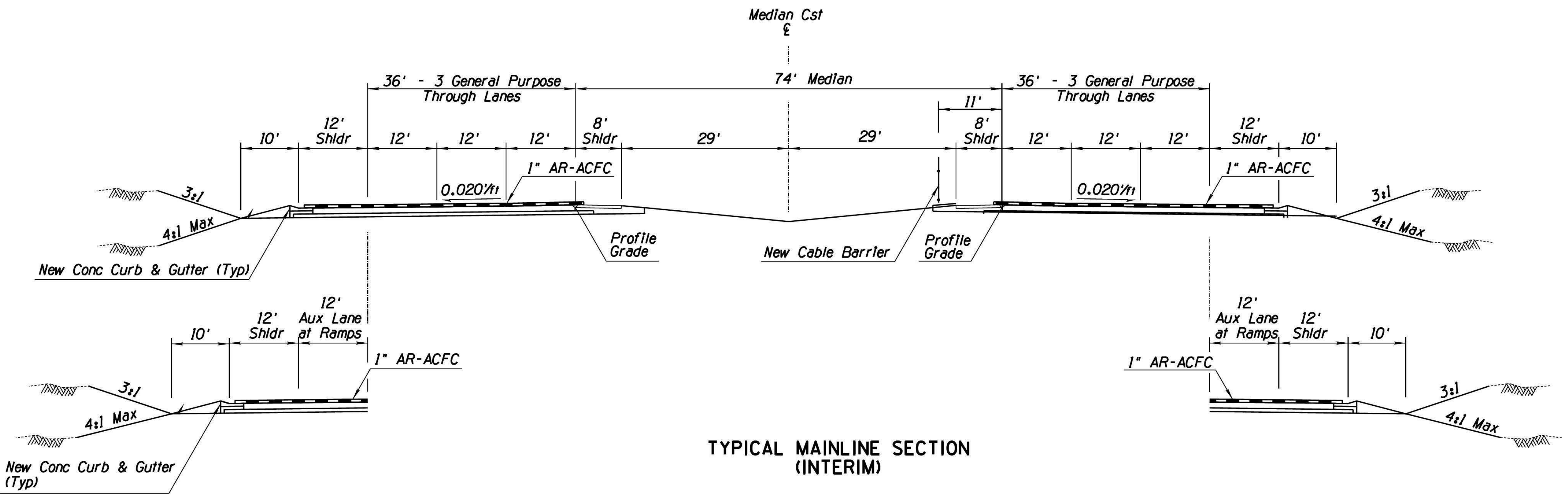
# **Appendix A**

**Plans and Typical Sections of Subsections**

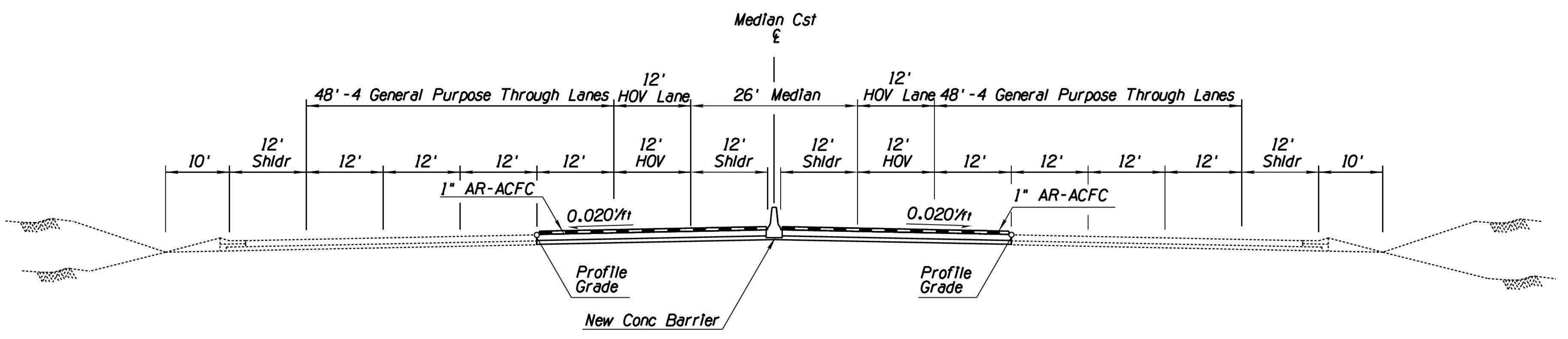
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000

DATE: LOCATION: REVISIONS: FINISHED PLANS: SURVEY NO. DATE: LOCATION: REVISIONS: FINISHED PLANS: SURVEY NO.



TYPICAL MAINLINE SECTION (INTERIM)



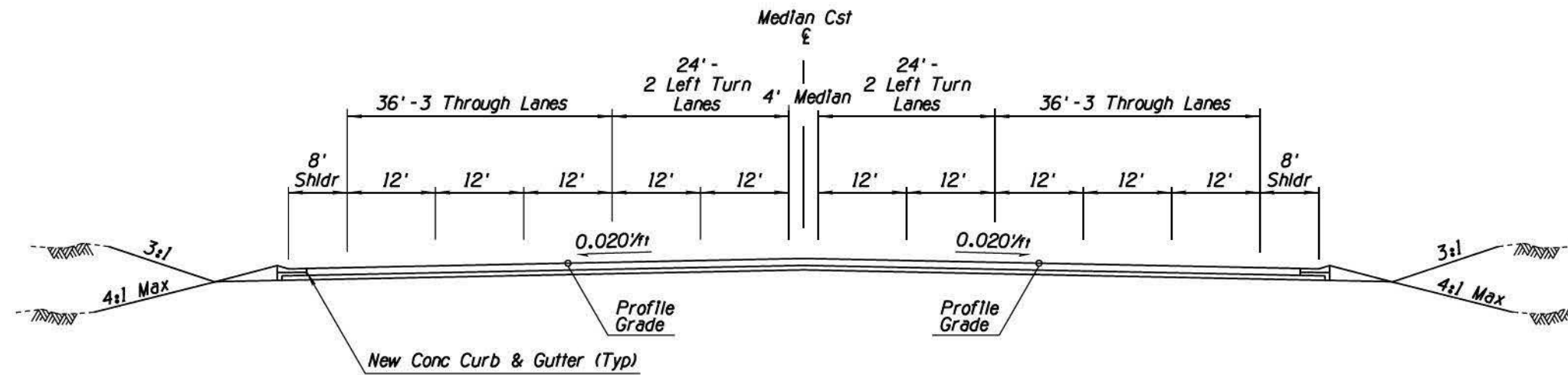
TYPICAL MAINLINE SECTION (ULTIMATE)

CALL FOR MORE DAYS OF STAKE-IT  
602-263-1100  
1-800-STAKE-IT  
(OUTSIDE MARICOPA COUNTY)

DESIGN	JB	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	AH	DATE	08/07		
CHECKED	BB	DATE	08/07		
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ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)	TRACS NO. H6876 OIL	
				AI OF A184	

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

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TYPICAL CROSSROAD SECTION

NOTE:  
Crossroad Cross Section Vary Depending on  
Municipal Jurisdictions and Street Classifications

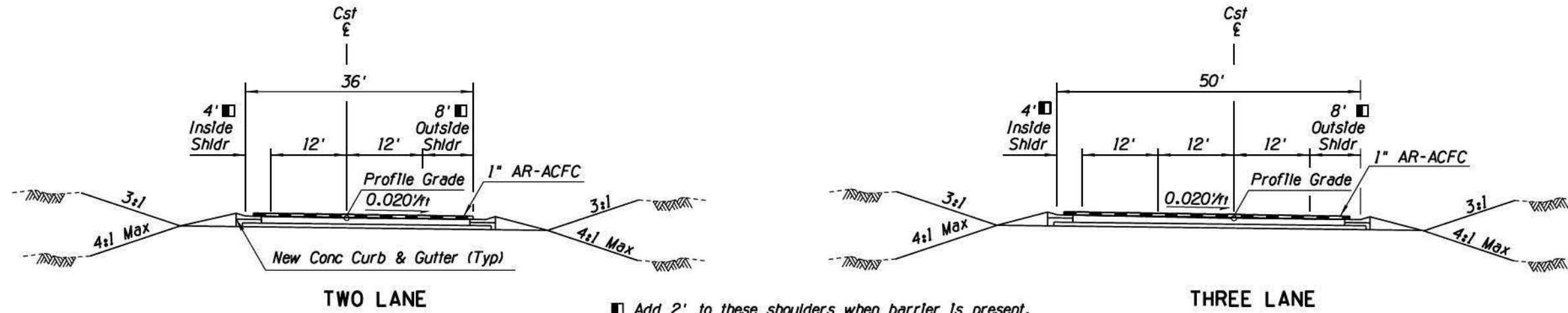
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DRAWN	AH	DATE	08/07		
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TRACS NO.	H6876 OIL			A2 OF A184	

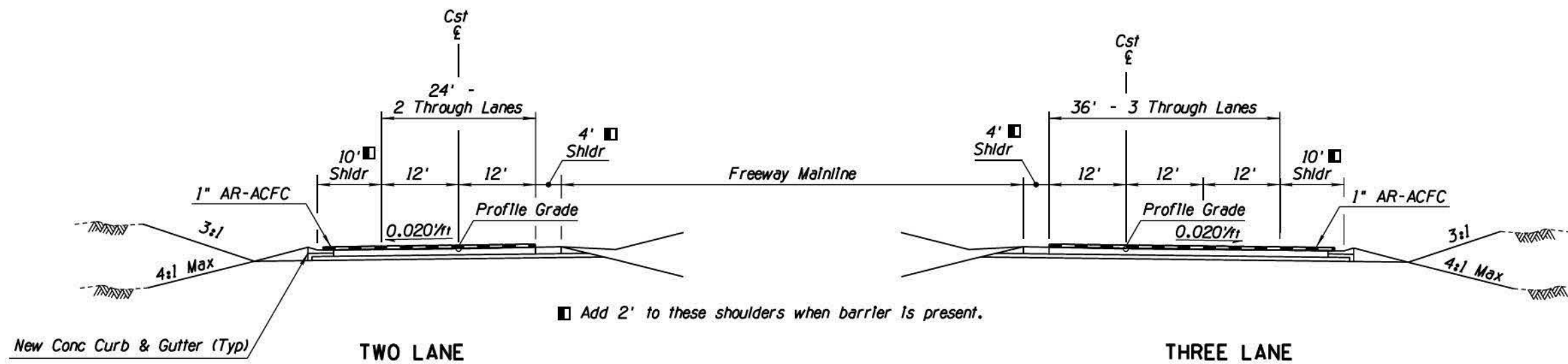
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

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■ Add 2' to these shoulders when barrier is present.

TYPICAL SECTION  
(DIRECTIONAL RAMPS)



■ Add 2' to these shoulders when barrier is present.

TYPICAL SECTION  
(COLLECTOR DISTRIBUTOR ROADS)

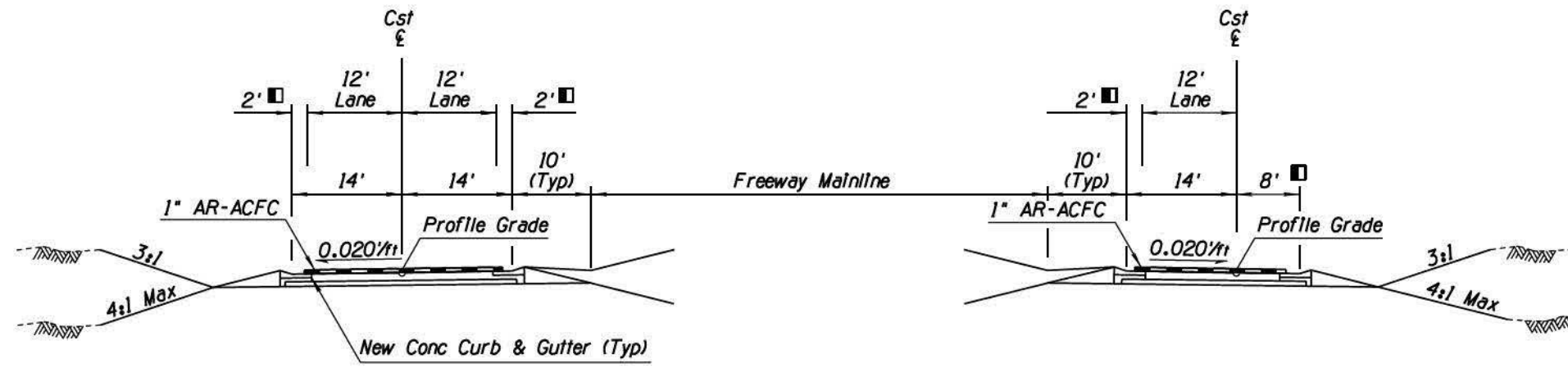


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DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
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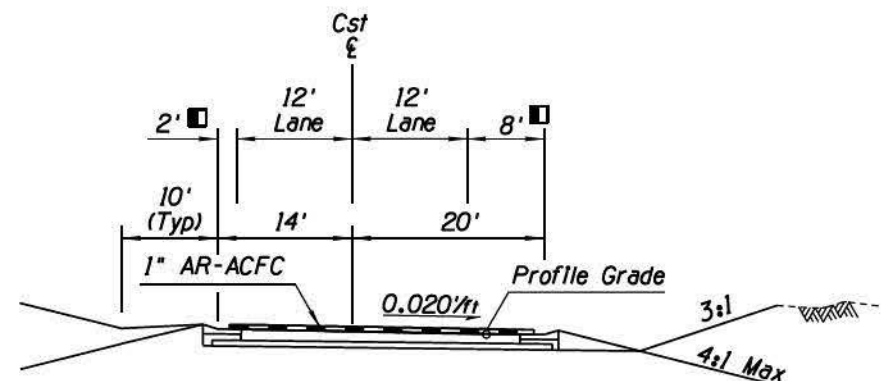
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TWO LANE ENTRANCE RAMP

SINGLE LANE EXIT RAMP

Freeway Mainline



TWO LANE EXIT RAMP

■ Add 2' to these shoulders when barrier is present

TYPICAL SECTION (RAMPS)



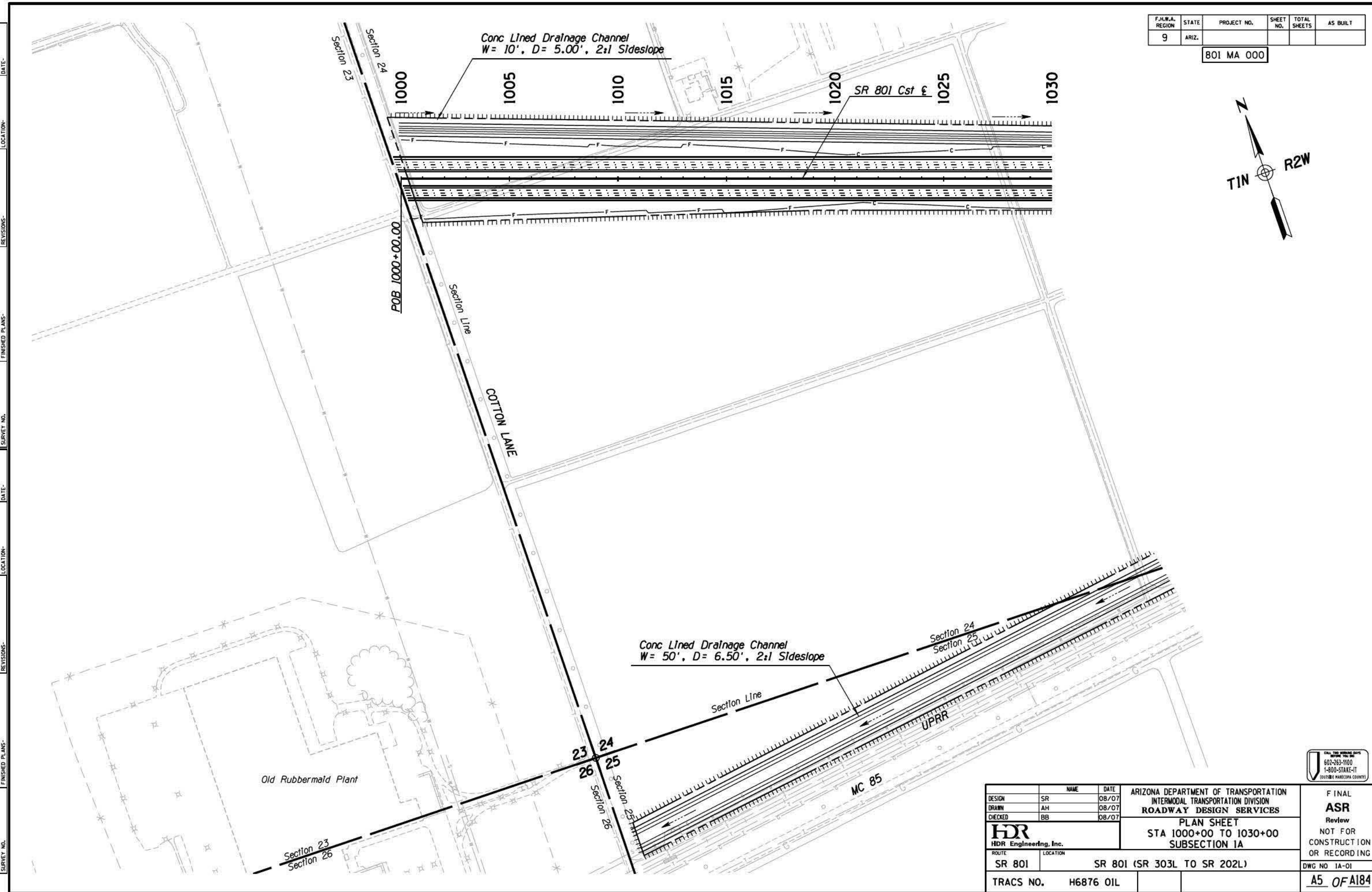
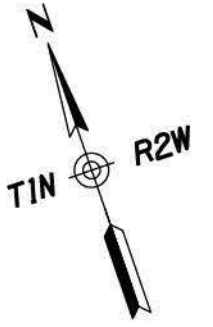
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F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
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DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

DESIGN	NAME	DATE
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AH		08/07
BB		08/07

ARIZONA DEPARTMENT OF TRANSPORTATION  
 INTERMODAL TRANSPORTATION DIVISION  
 ROADWAY DESIGN SERVICES  
 PLAN SHEET  
 STA 1000+00 TO 1030+00  
 SUBSECTION 1A



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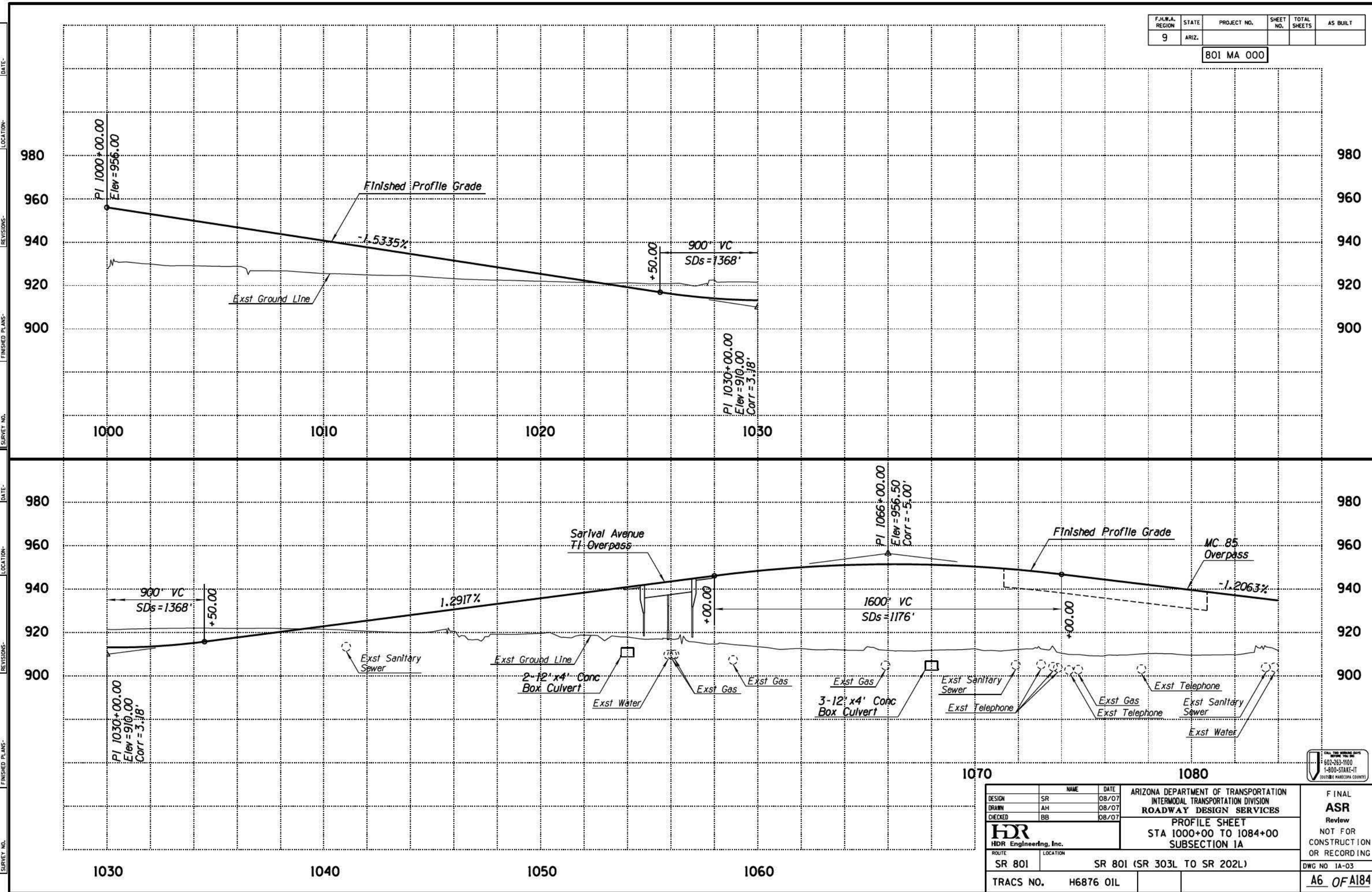
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TRACS NO. H6876 OIL

A5 OF A184

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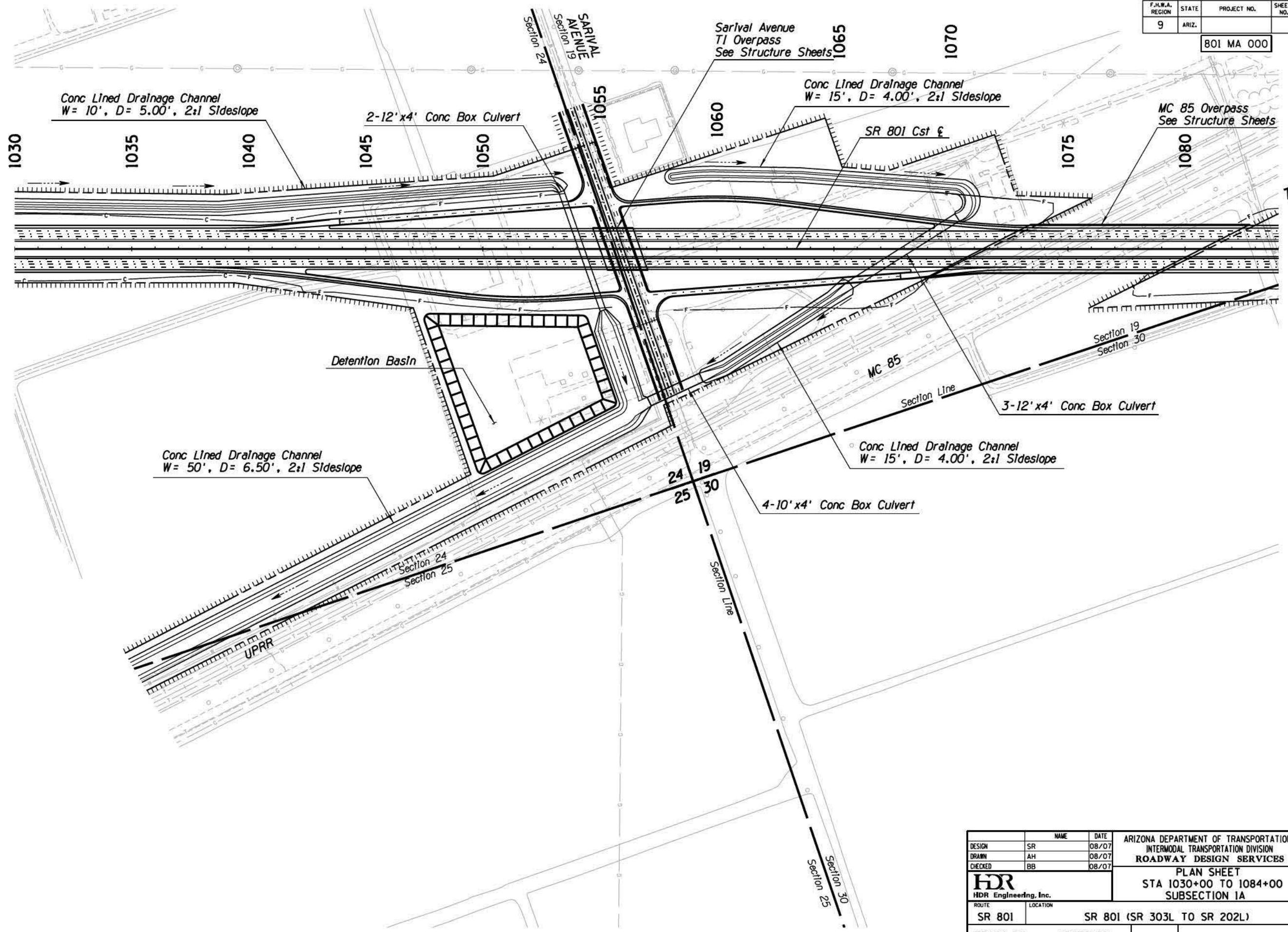
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 ROADWAY DESIGN SERVICES

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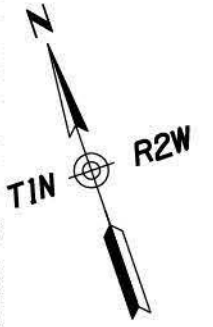
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TRACS NO.	H6876 OIL			A6 OF A184

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
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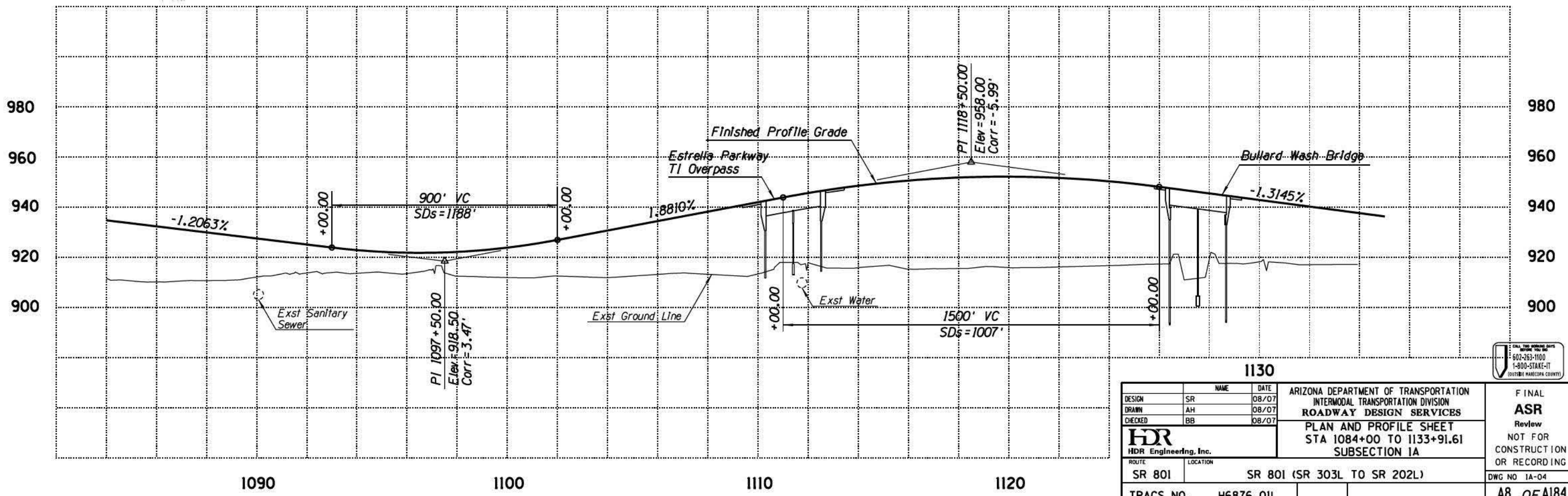
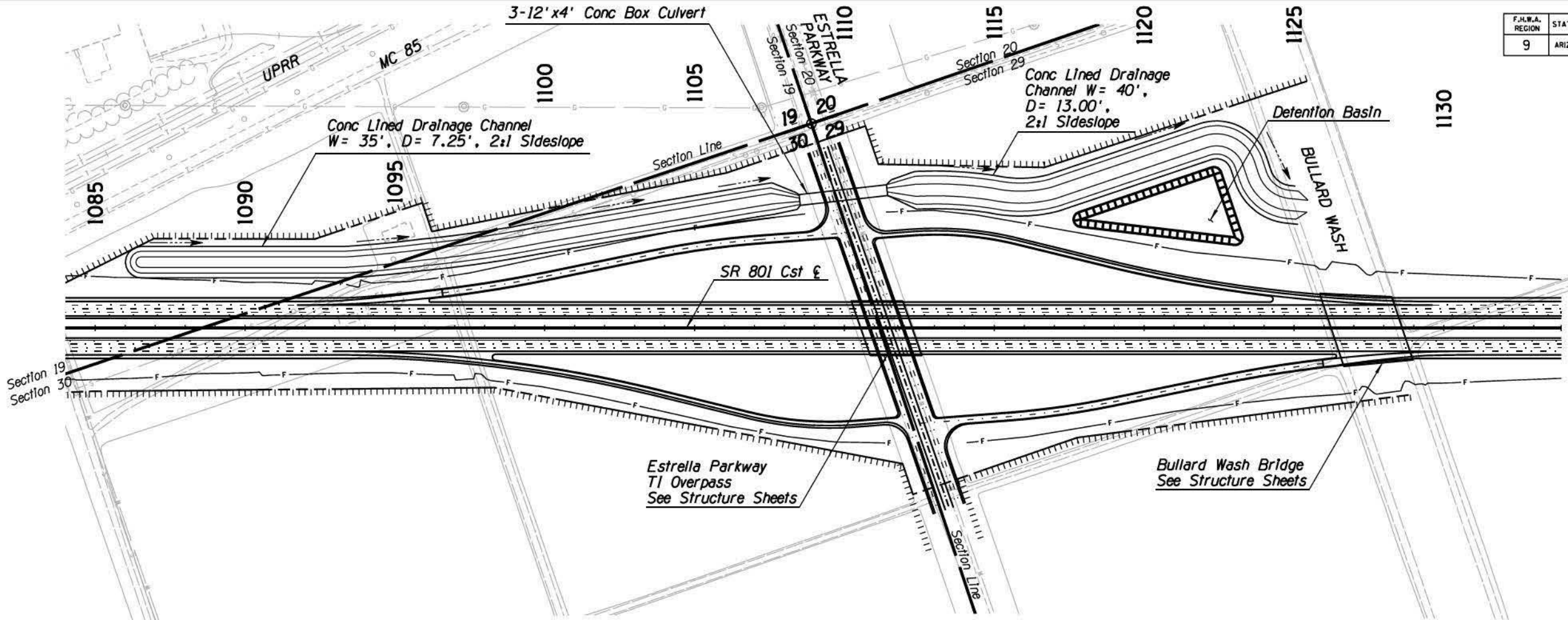
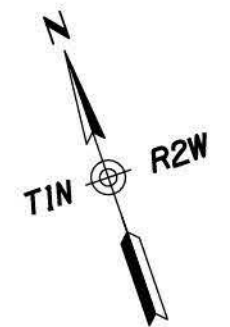


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ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)	DWG NO 1A-02	
TRACS NO.	H6876 OIL				A7 OF A184



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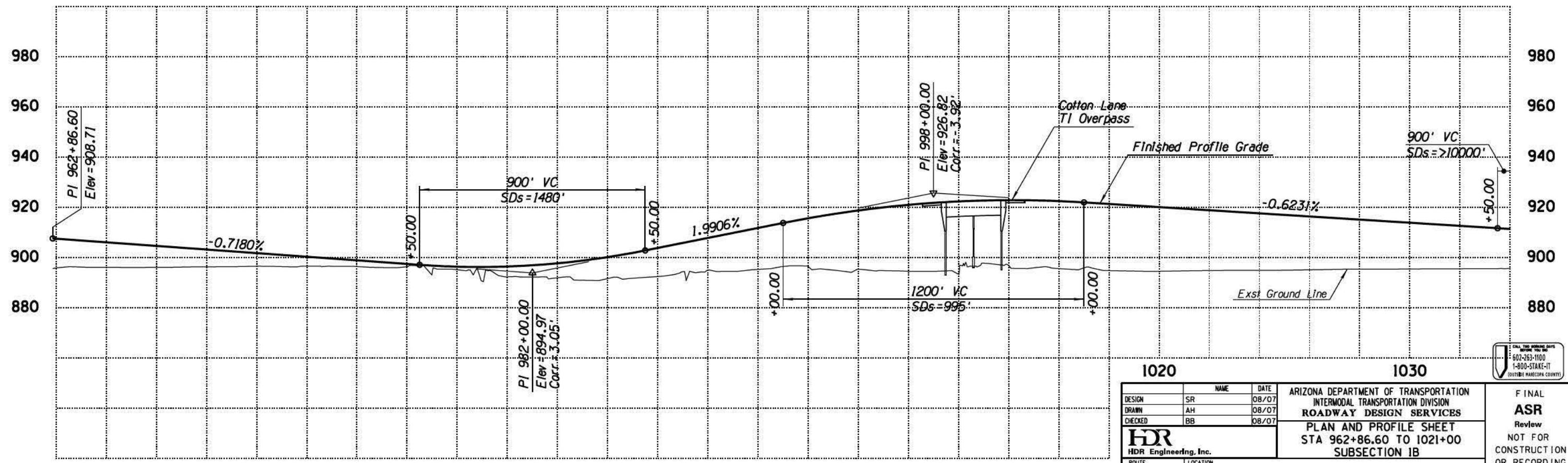
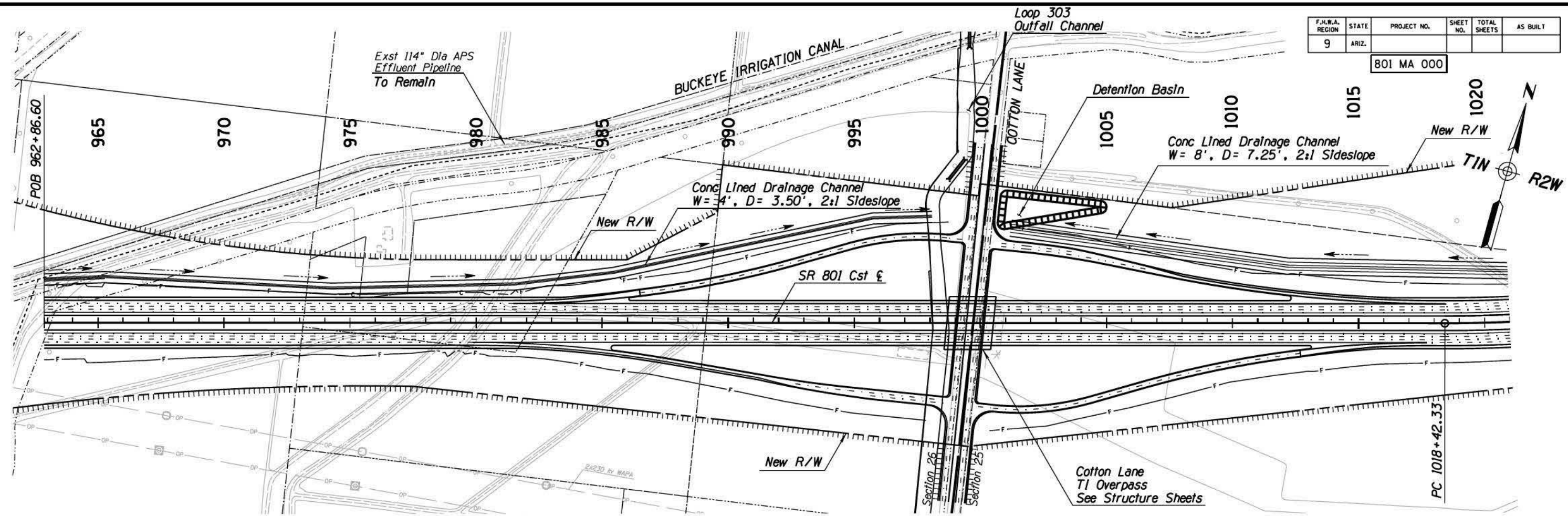
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LOCATION		SR 801 (SR 303L TO SR 202L)			
TRACS NO.		H6876 OIL		A8 OF A184	

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
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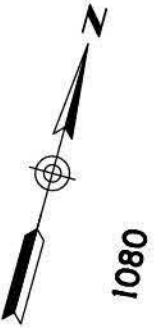
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CHECKED	BB	DATE	08/07		
HDR Engineering, Inc.					
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TRACS NO.	H6876 OIL				

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

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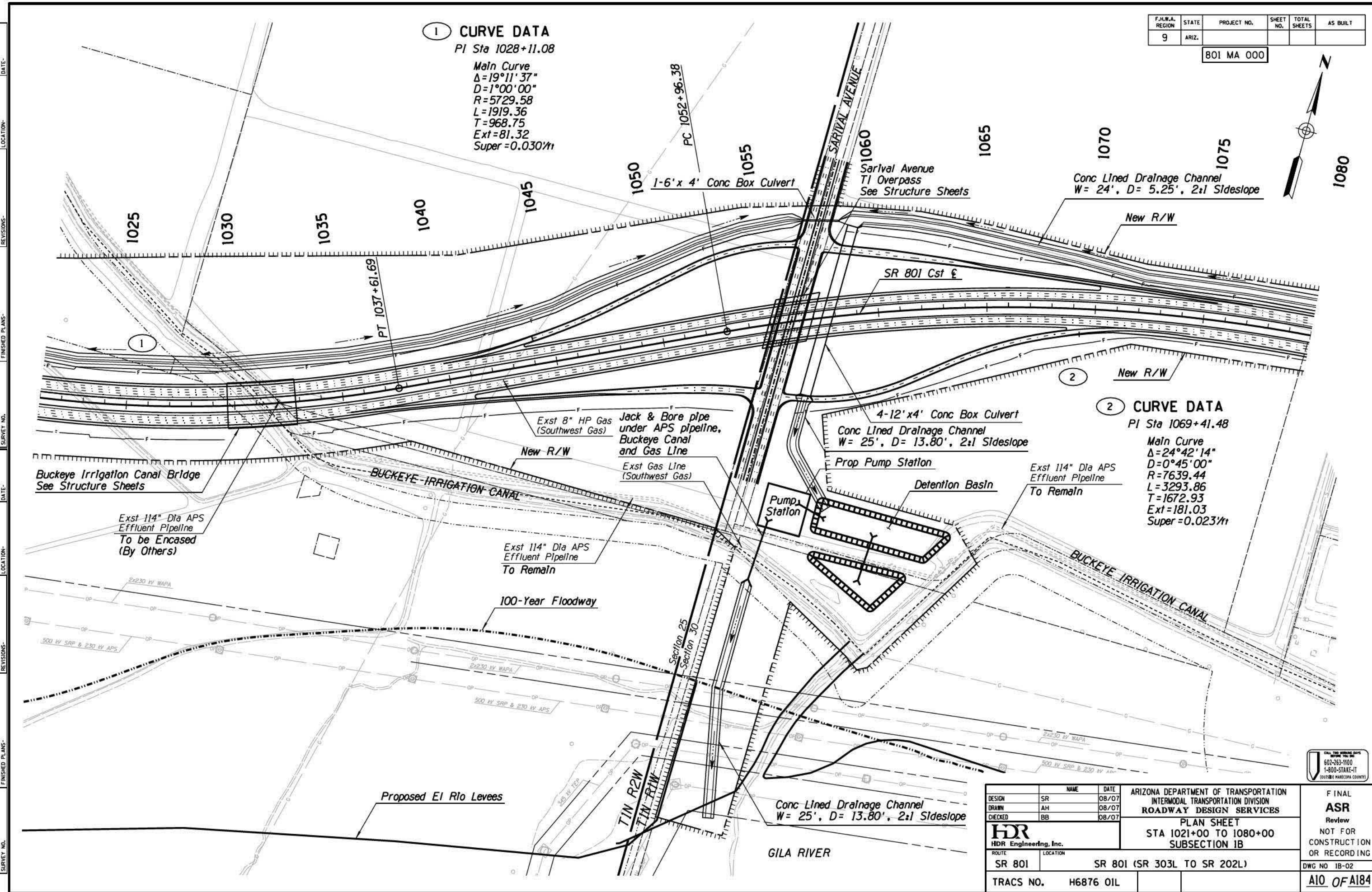


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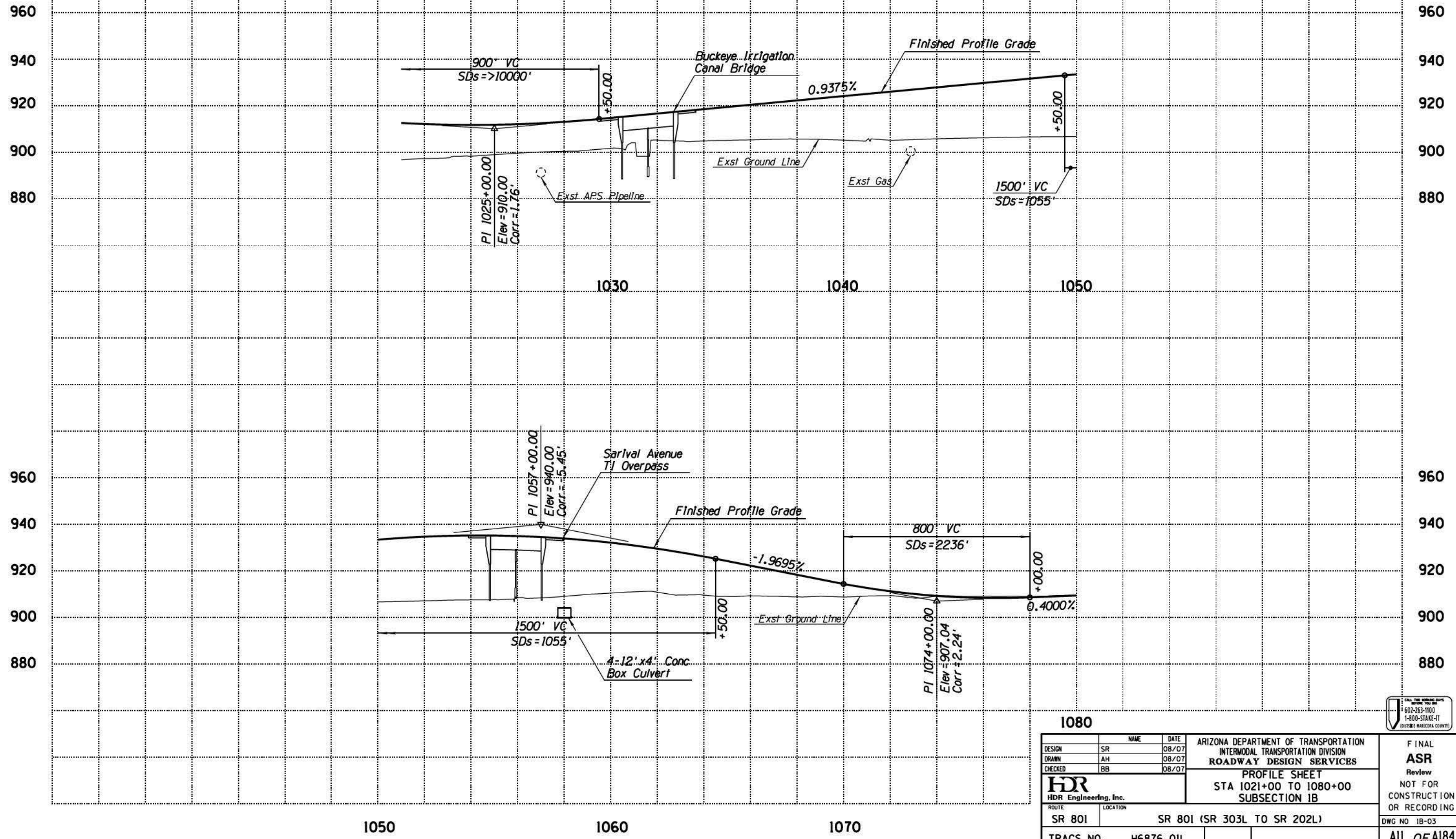
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**A10 OF A184**

ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)
TRACS NO.	H6876 OIL		

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



1080

DESIGN	SR	08/07
DRAWN	AH	08/07
CHECKED	BB	08/07

ARIZONA DEPARTMENT OF TRANSPORTATION  
INTERMODAL TRANSPORTATION DIVISION  
ROADWAY DESIGN SERVICES



PROFILE SHEET  
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SUBSECTION 1B

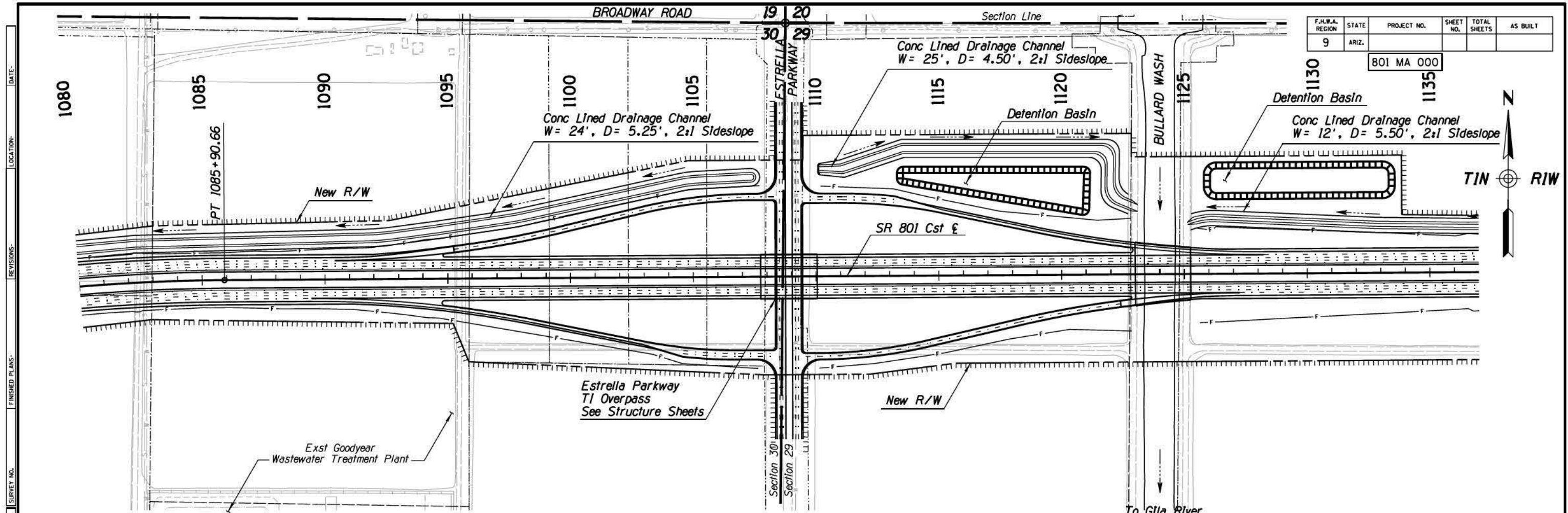
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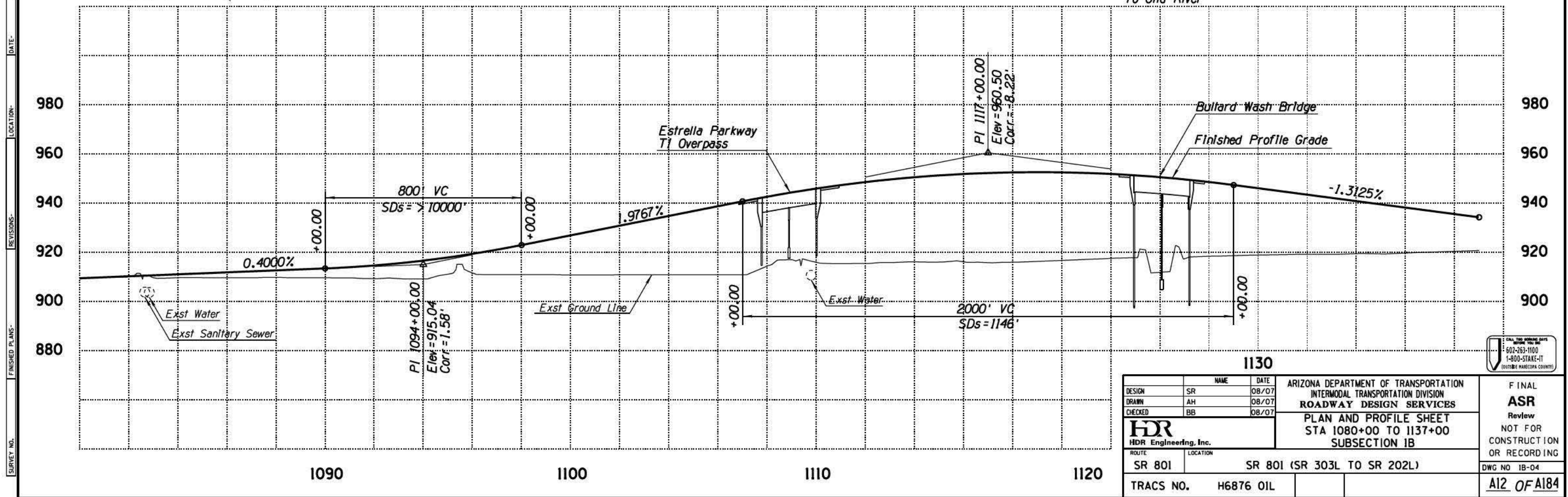
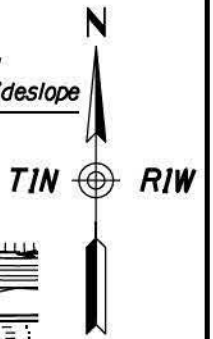
TRACS NO. H6876 OIL

All OF A184



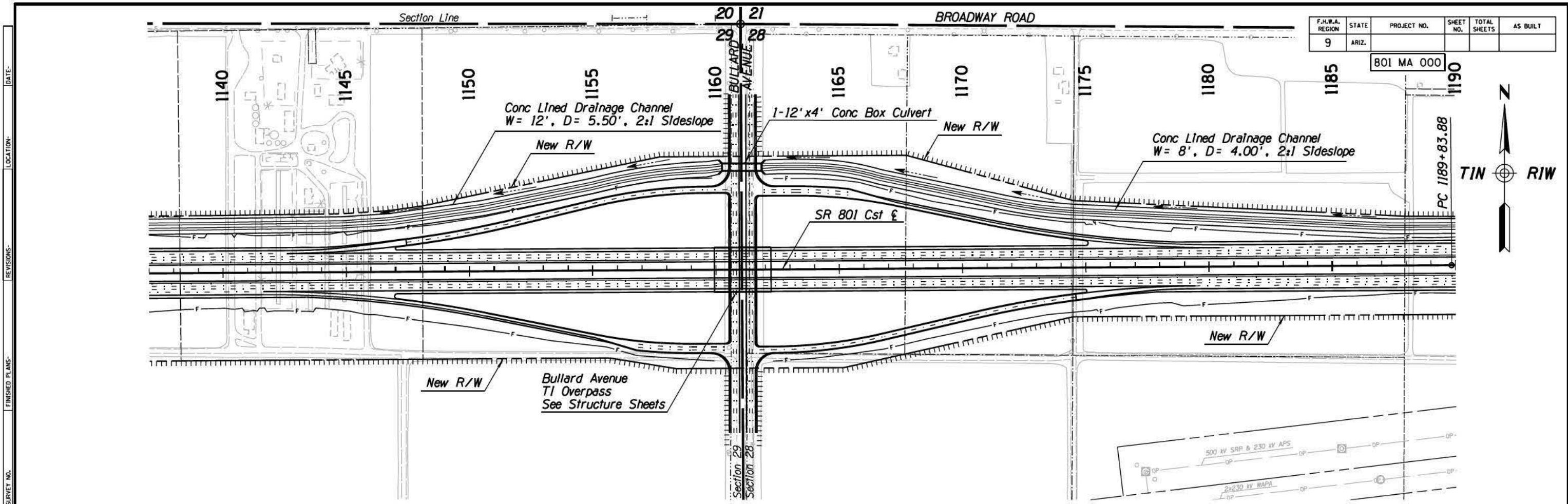
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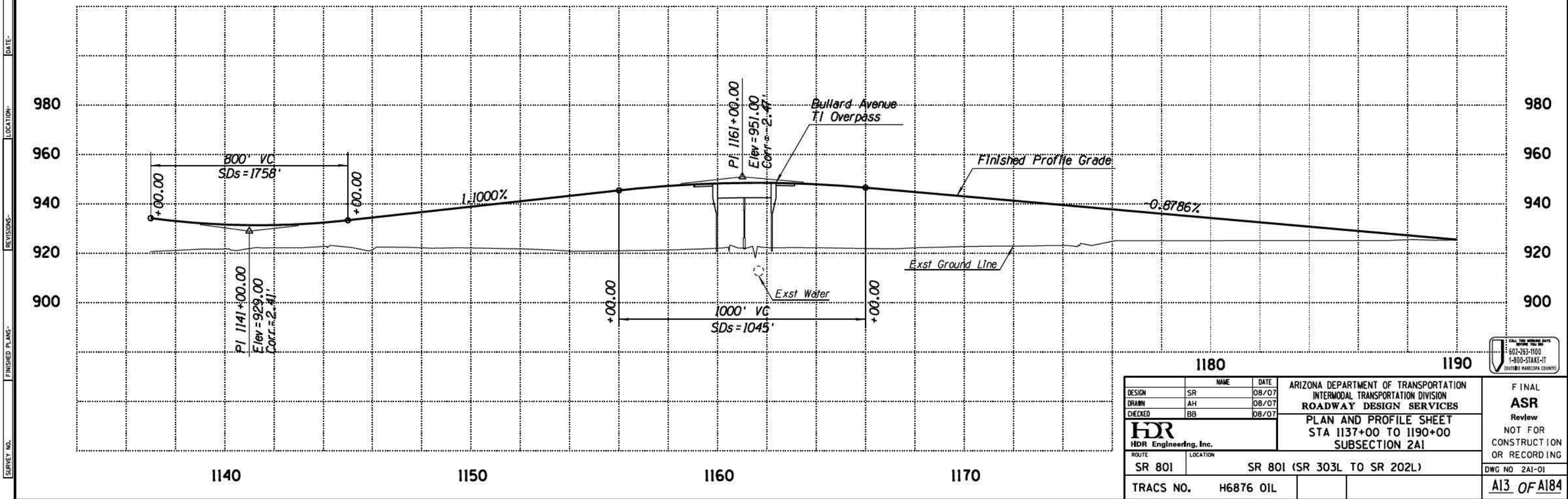
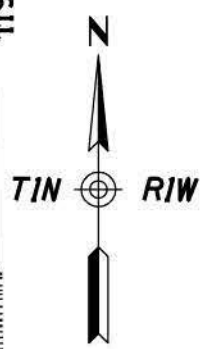


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TRACS NO.		H6876 OIL		A12 OF A184	





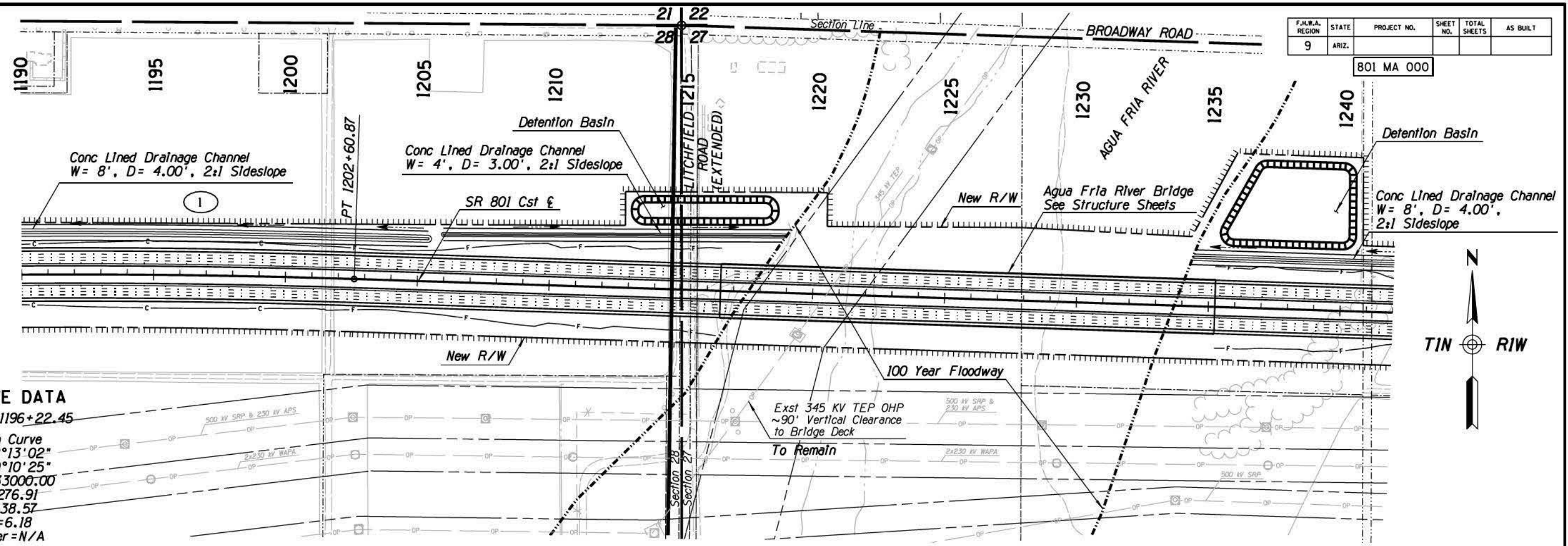
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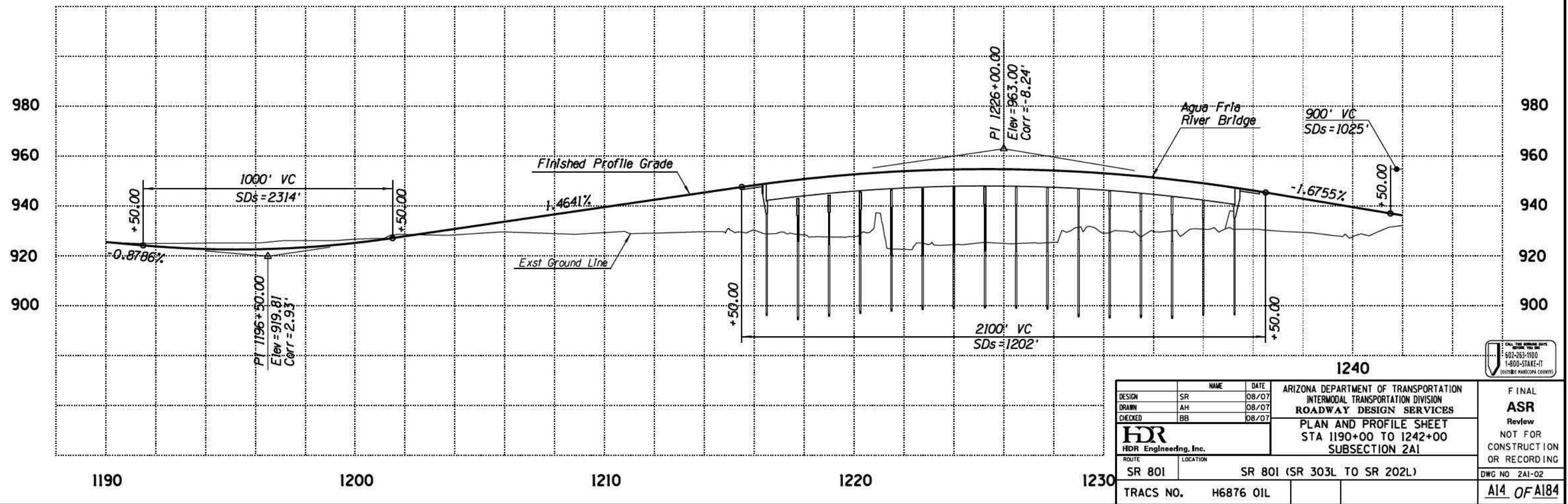
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TRACS NO.		H6876 OIL		A13 OF A184	

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9	ARIZ.				

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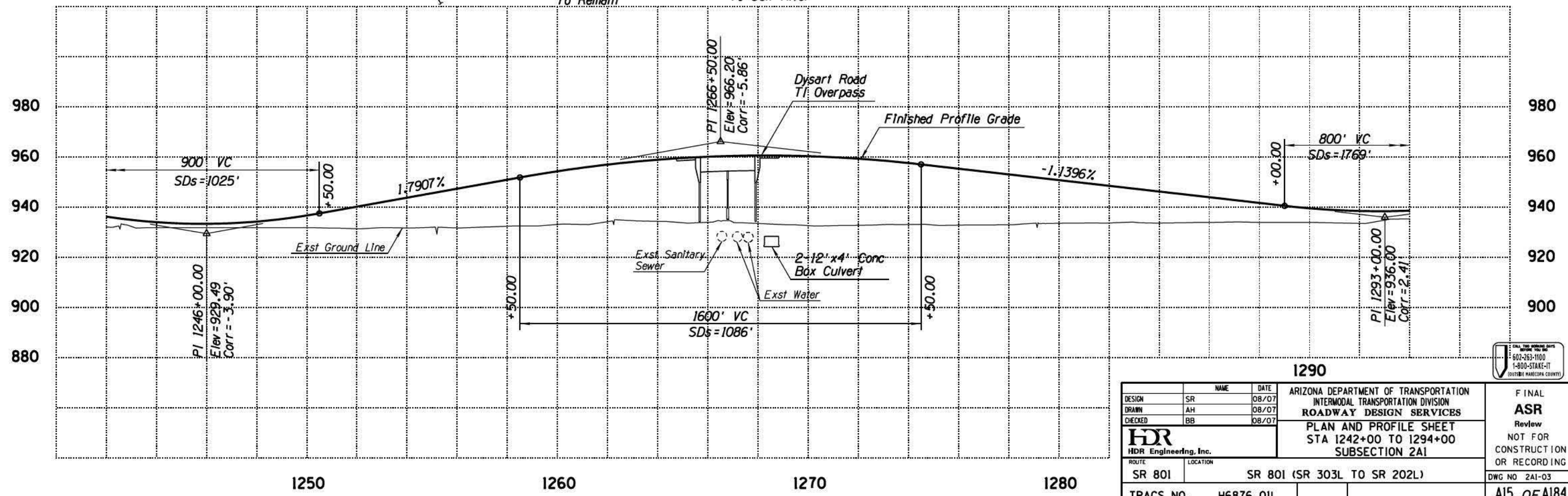
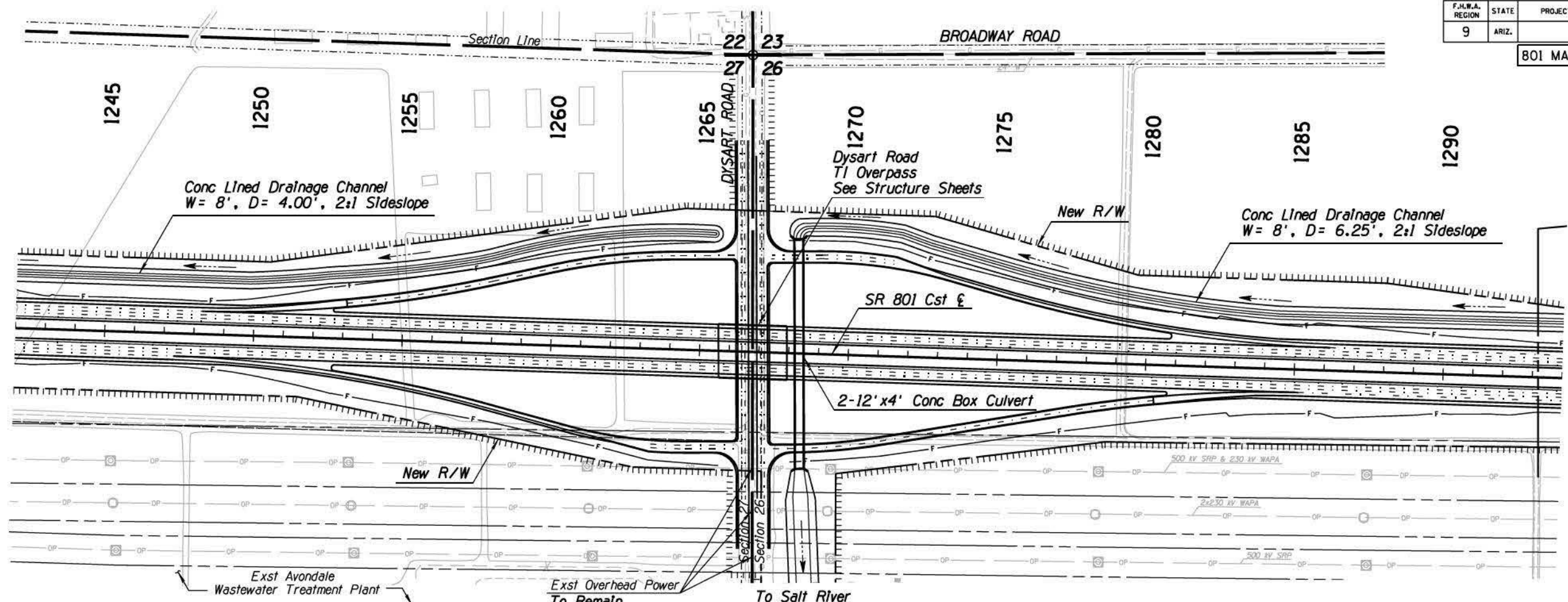
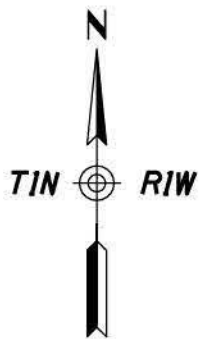
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 $L = 1276.91$   
 $T = 638.57$   
 $Ext = 6.18$   
 $Super = N/A$



DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		AH	08/07		
CHECKED		BB	08/07		
ROUTE		SR 801		PLAN AND PROFILE SHEET STA 1190+00 TO 1242+00 SUBSECTION 2A1	
LOCATION		SR 801 (SR 303L TO SR 202L)		DWG NO 2A1-02	
TRACS NO.		H6876 OIL		A14 OF A184	

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

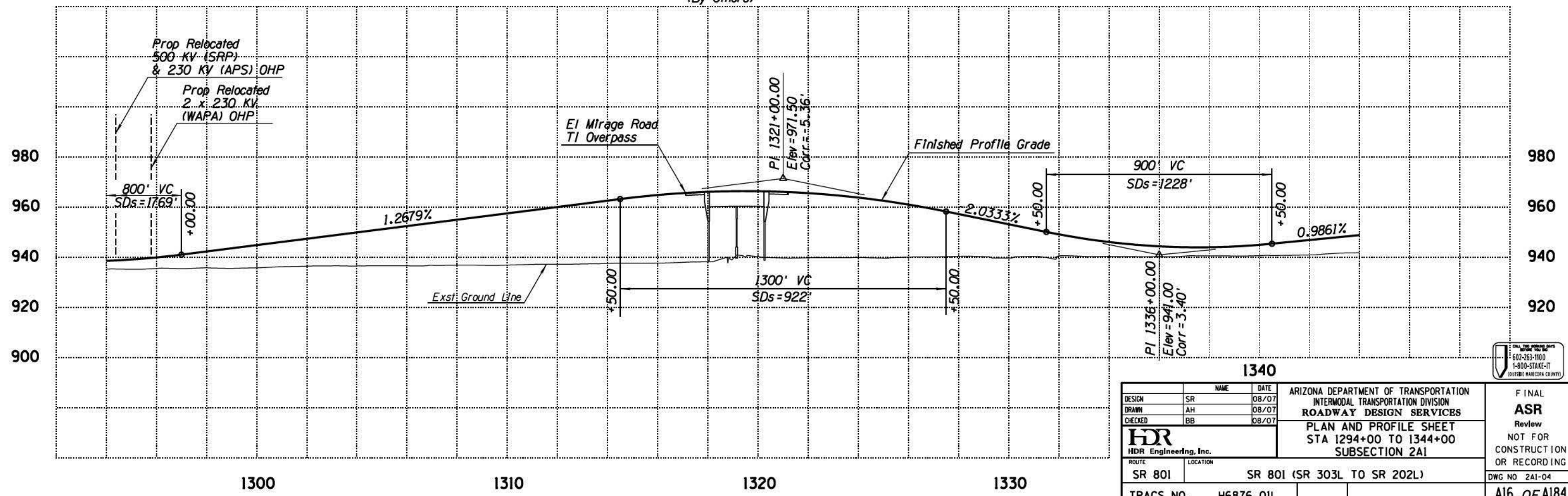
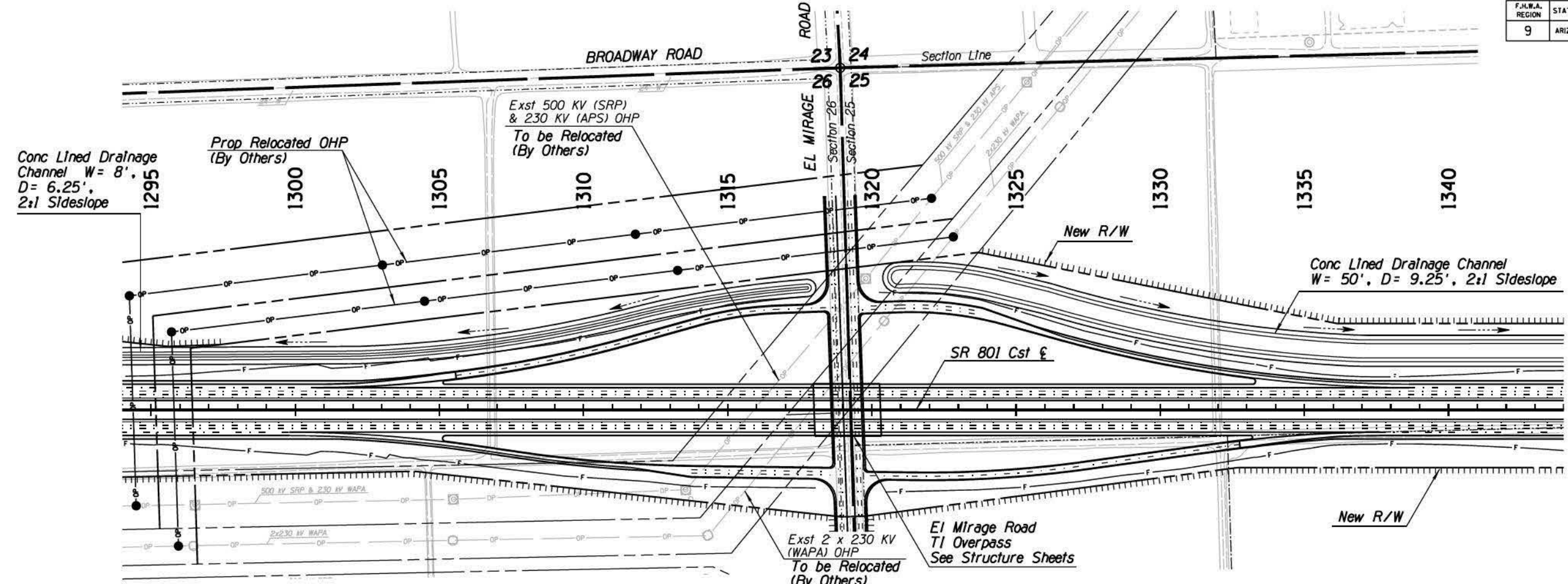
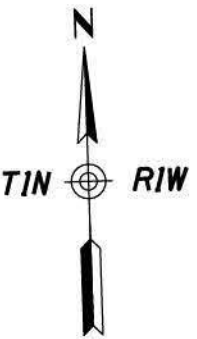
801 MA 000



DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING	
DRAWN	AH	DATE	08/07			
CHECKED	BB	DATE	08/07			
ROUTE		SR 801 (SR 303L TO SR 202L)				DWG NO 241-03
LOCATION		SR 801 (SR 303L TO SR 202L)				A15 OF A184
TRACS NO.		H6876 OIL				

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

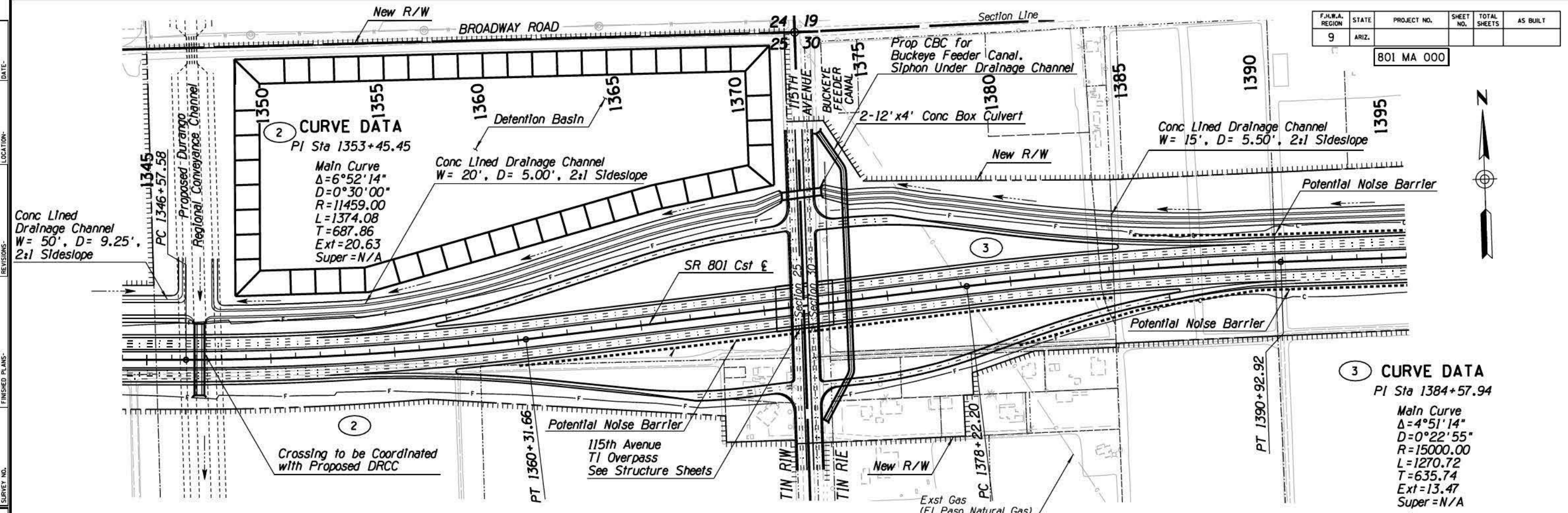
801 MA 000



DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		AH	08/07		
CHECKED		BB	08/07		
				<b>PLAN AND PROFILE SHEET</b> STA 1294+00 TO 1344+00 SUBSECTION 2A1	DWG NO 2A1-04 <b>A16 OF A184</b>
ROUTE	LOCATION	SR 801 SR 303L TO SR 202L			
TRACS NO.		H6876 OIL			

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

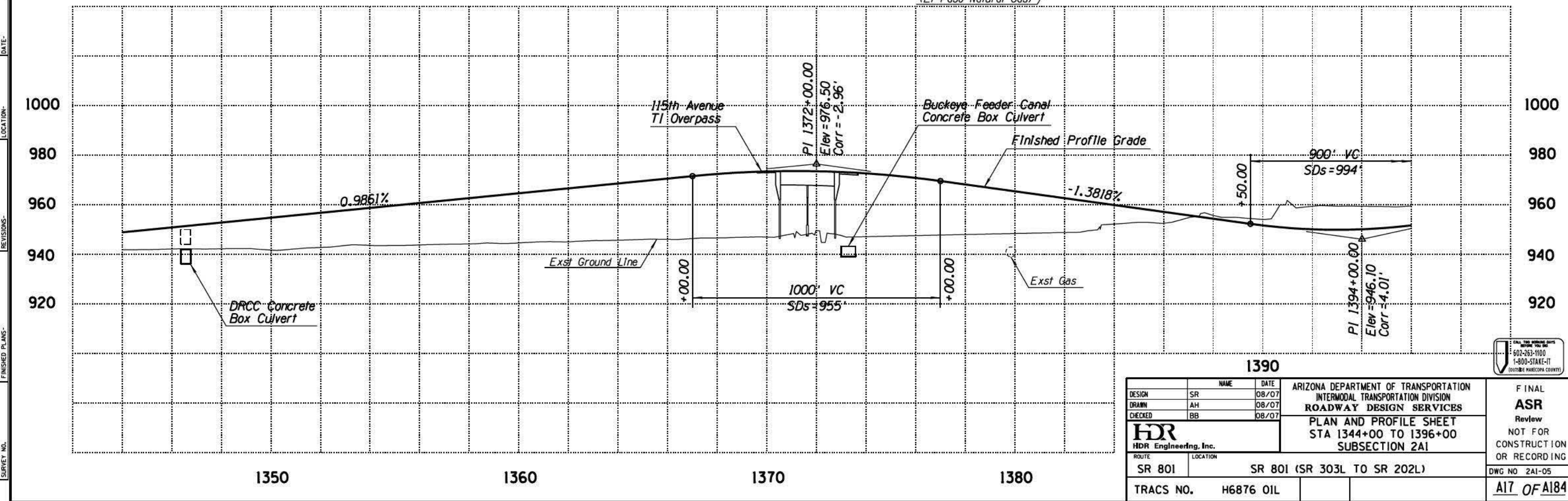
801 MA 000



**2 CURVE DATA**  
 PI Sta 1353+45.45  
 Main Curve  
 $\Delta = 6^\circ 52' 14''$   
 $D = 0^\circ 30' 00''$   
 $R = 11459.00$   
 $L = 1374.08$   
 $T = 687.86$   
 $Ext = 20.63$   
 $Super = N/A$

**3 CURVE DATA**  
 PI Sta 1384+57.94  
 Main Curve  
 $\Delta = 4^\circ 51' 14''$   
 $D = 0^\circ 22' 55''$   
 $R = 15000.00$   
 $L = 1270.72$   
 $T = 635.74$   
 $Ext = 13.47$   
 $Super = N/A$

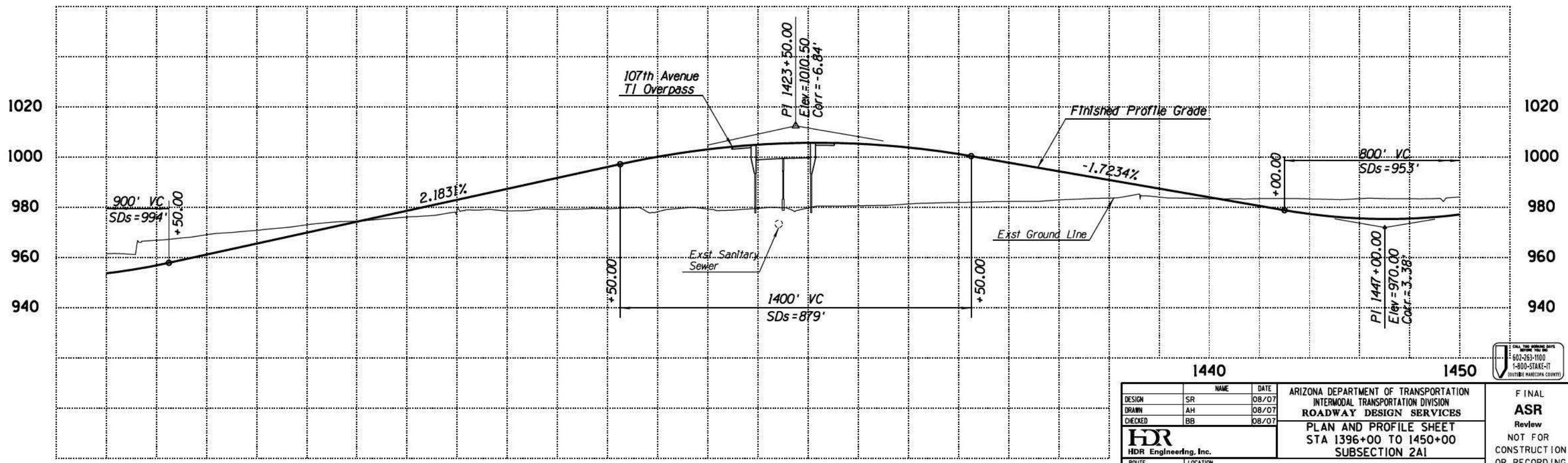
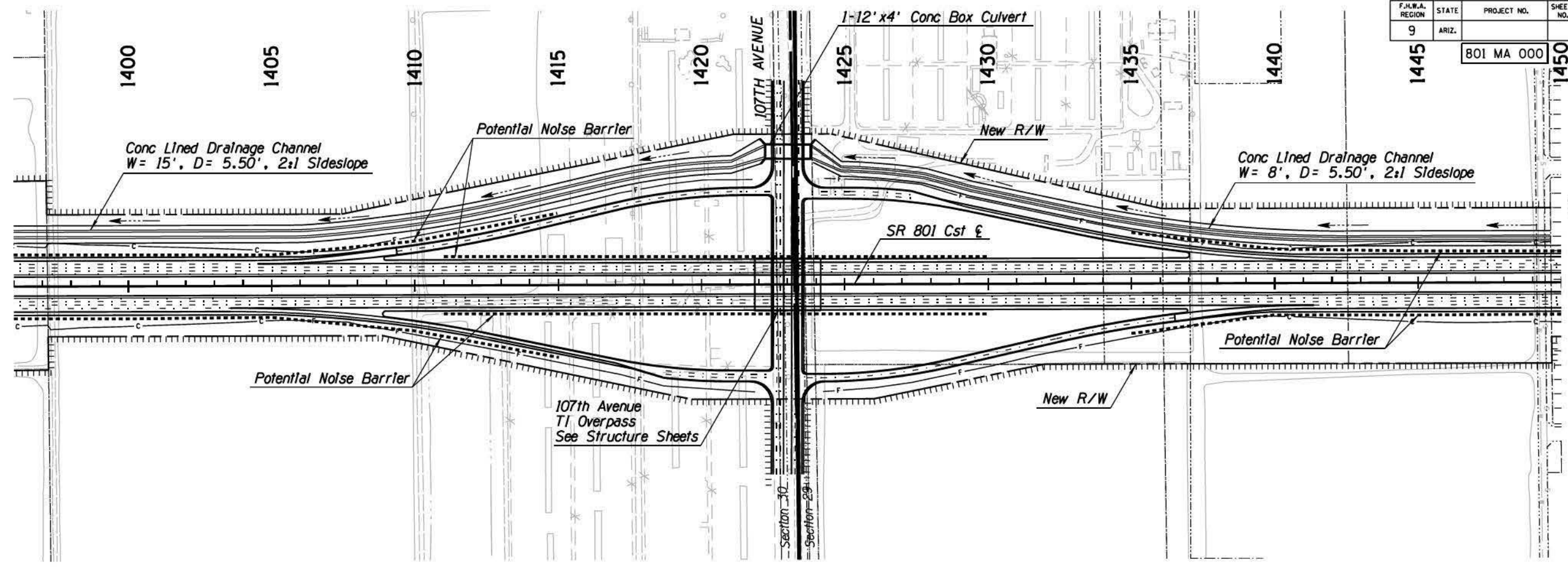
2  
 Crossing to be Coordinated with Proposed DRCC



DESIGN	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL ASR Review NOT FOR CONSTRUCTION OR RECORDING
SR		08/07		
SR		08/07		
DRAWN	AH	08/07	PLAN AND PROFILE SHEET STA 1344+00 TO 1396+00 SUBSECTION 2A1	DWG NO 2A1-05
CHECKED	BB	08/07		
			SR 801 (SR 303L TO SR 202L)	A17 OF A184
ROUTE	LOCATION			
SR 801			TRACS NO. H6876 OIL	

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000

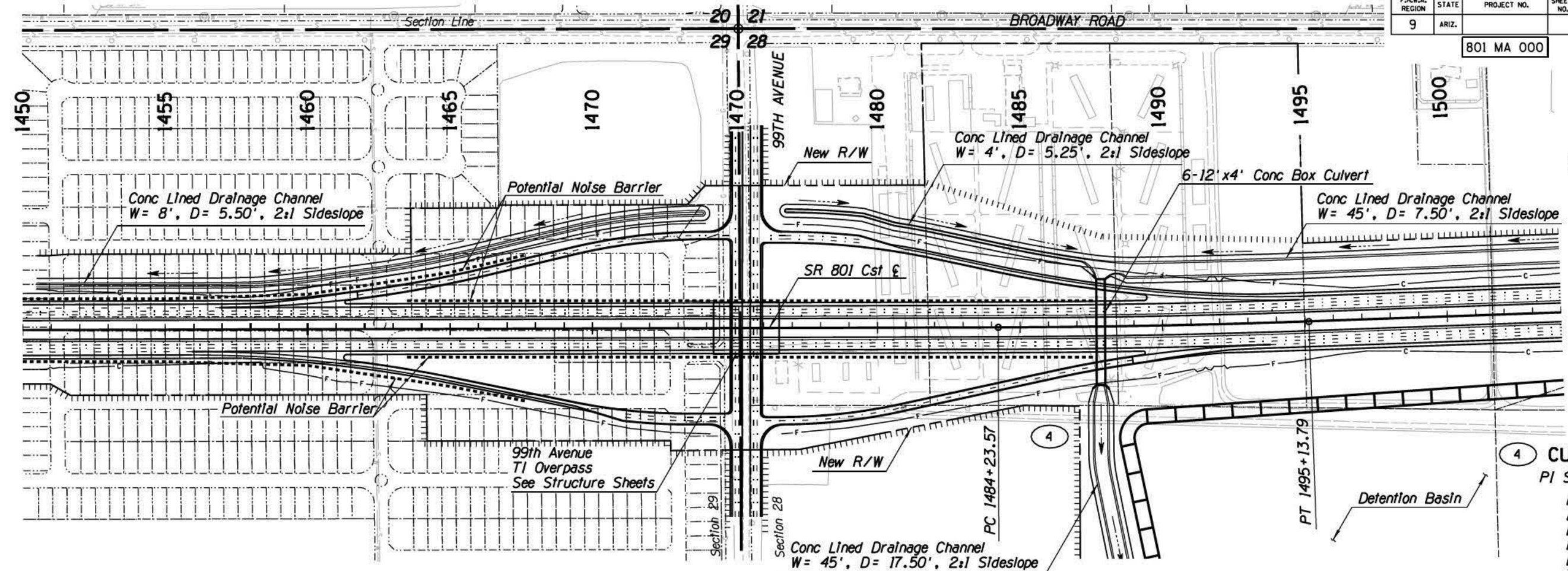


1440		1450	
DESIGN	SR	DATE	08/07
DRAWN	AH	DATE	08/07
CHECKED	BB	DATE	08/07
 HDR Engineering, Inc.		ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES PLAN AND PROFILE SHEET STA 1396+00 TO 1450+00 SUBSECTION 2A1	
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)
TRACS NO.	H6876 OIL	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING DWG NO 2A1-06 <b>A18 OF A184</b>	

DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

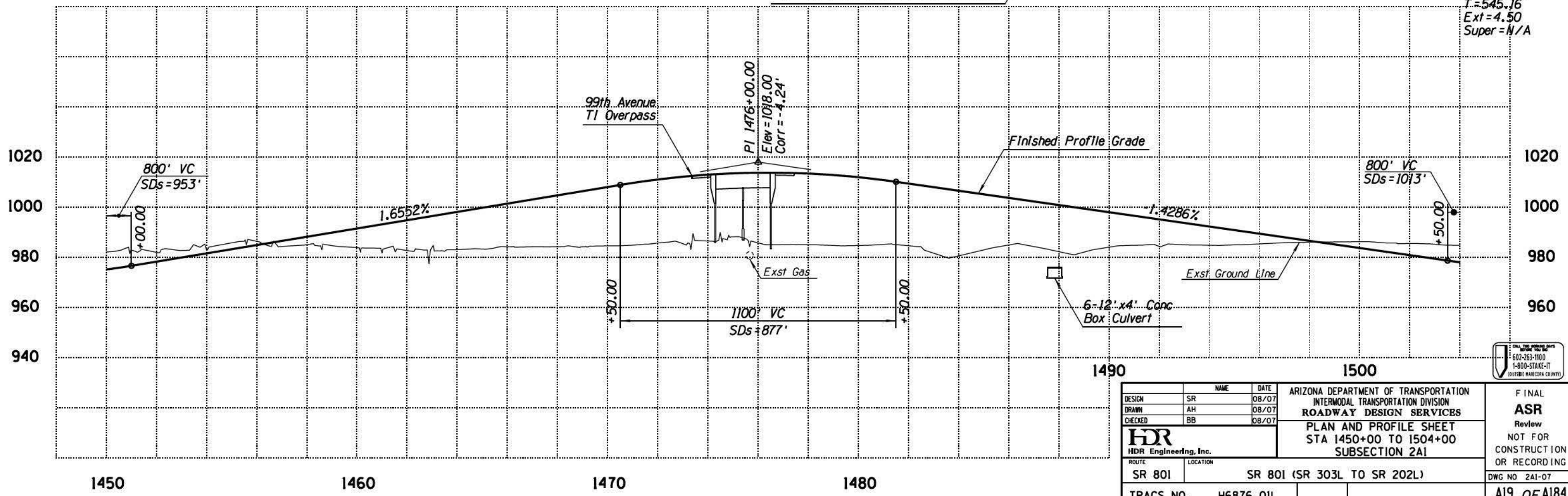
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



**4 CURVE DATA**  
PI Sta 1489+68.73

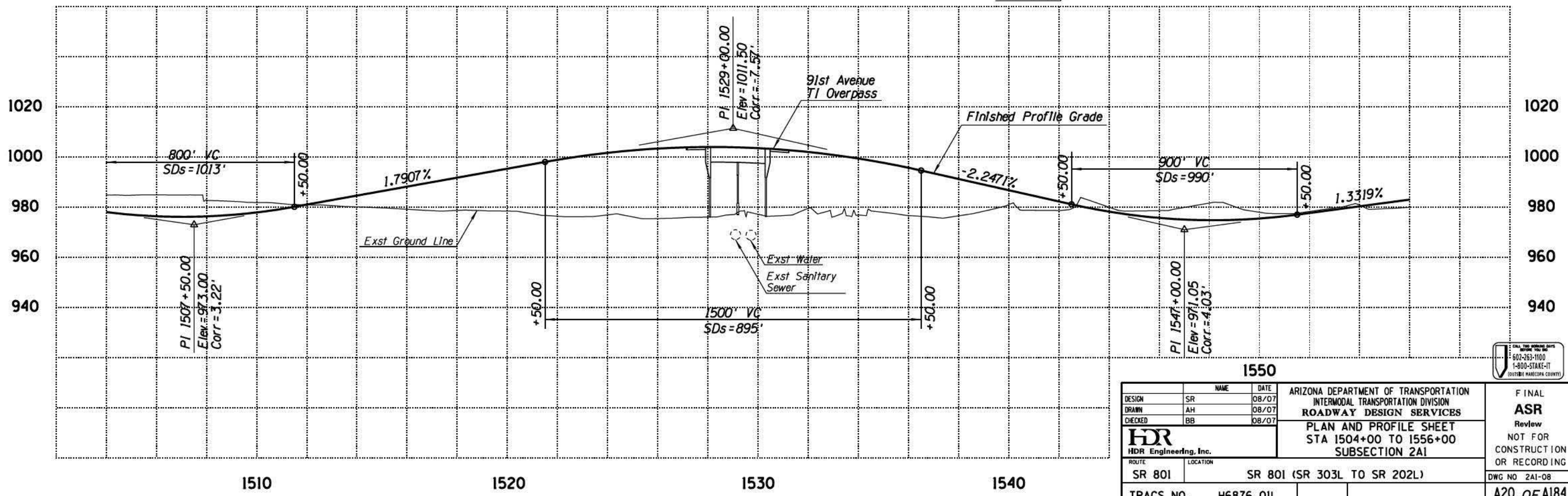
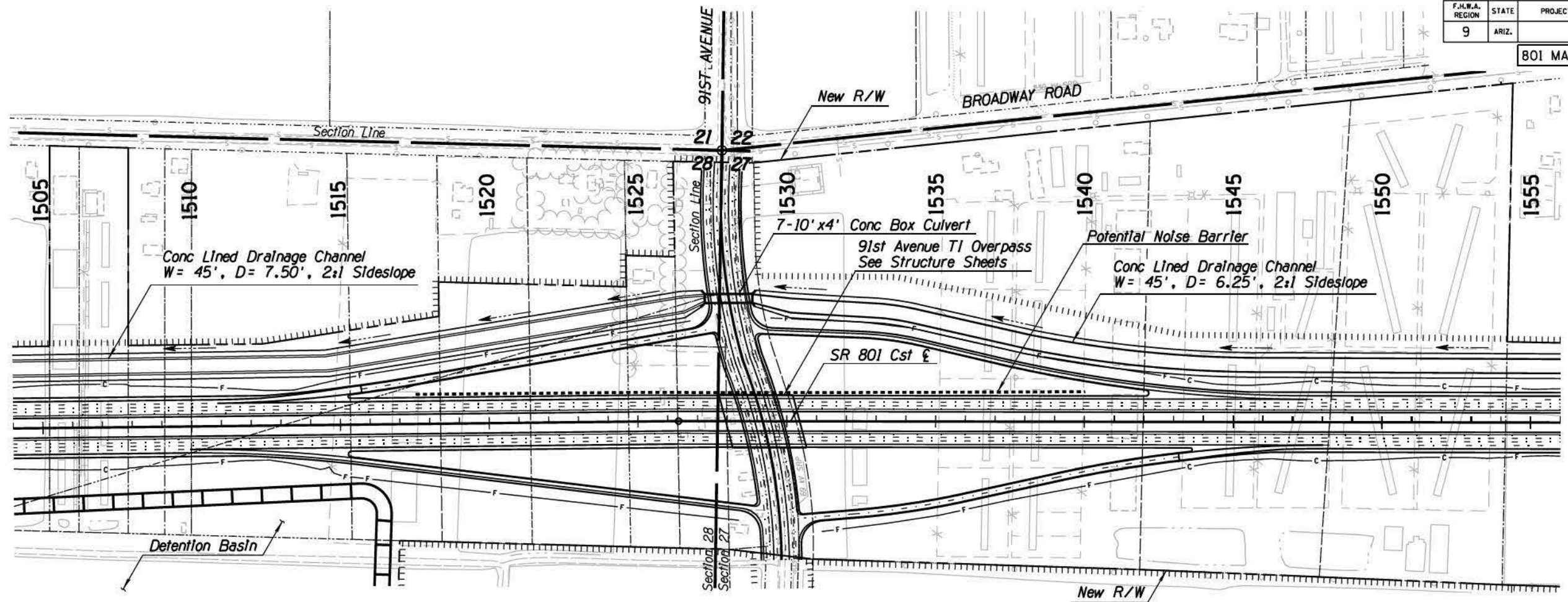
Main Curve  
 $\Delta = 1^\circ 53' 34''$   
 $D = 0^\circ 10' 25''$   
 $R = 33000.00$   
 $L = 1090.22$   
 $T = 545.16$   
 $Ext = 4.50$   
 $Super = N/A$



DESIGN	SR	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	AH		08/07		
CHECKED	BB		08/07		
		<b>PLAN AND PROFILE SHEET</b> STA 1450+00 TO 1504+00 SUBSECTION 2A1		DWG NO 2A1-07	
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)		
TRACS NO.	H6876 OIL		A19 OF A184		

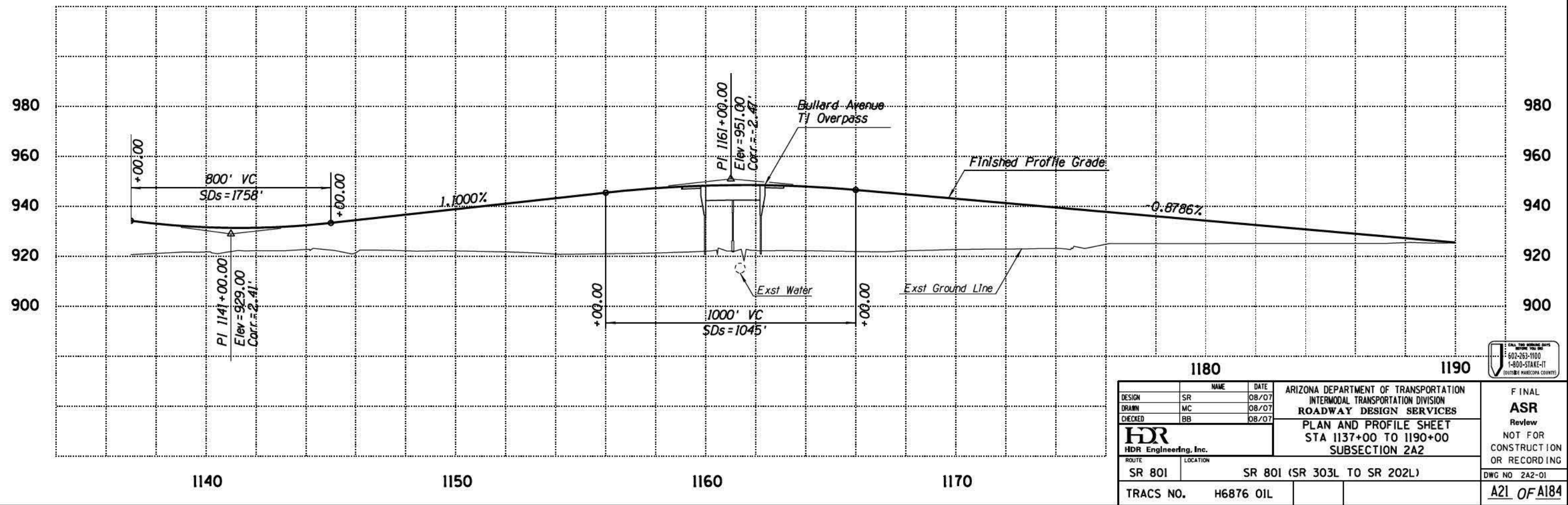
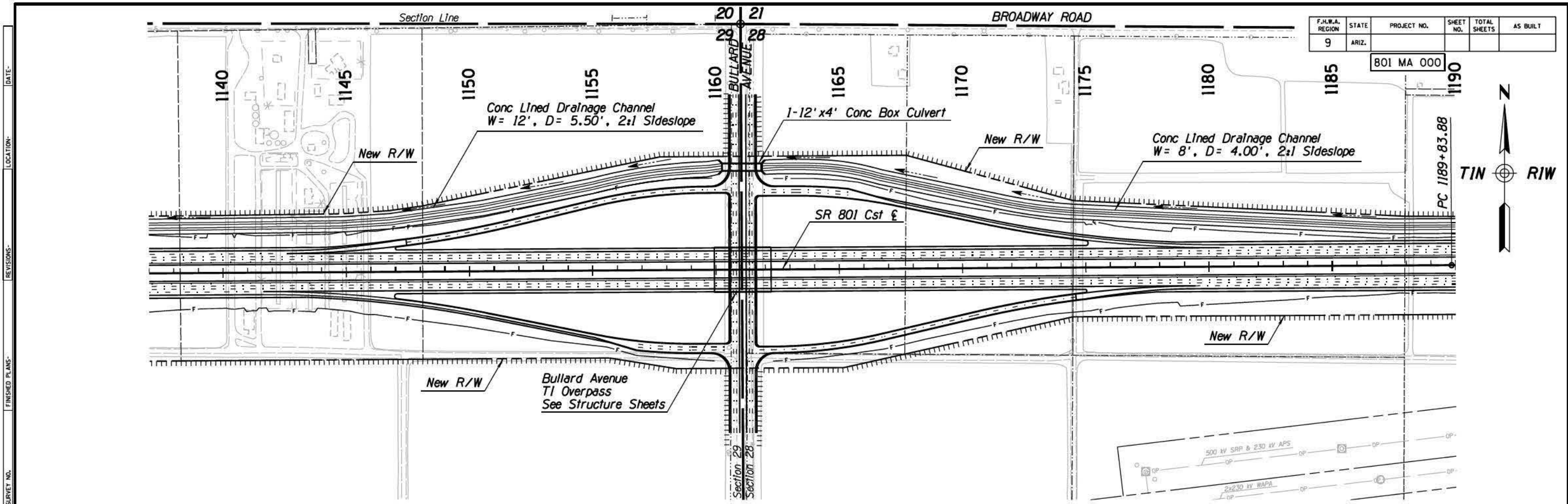
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



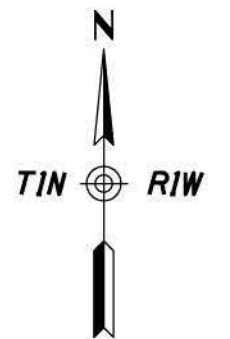
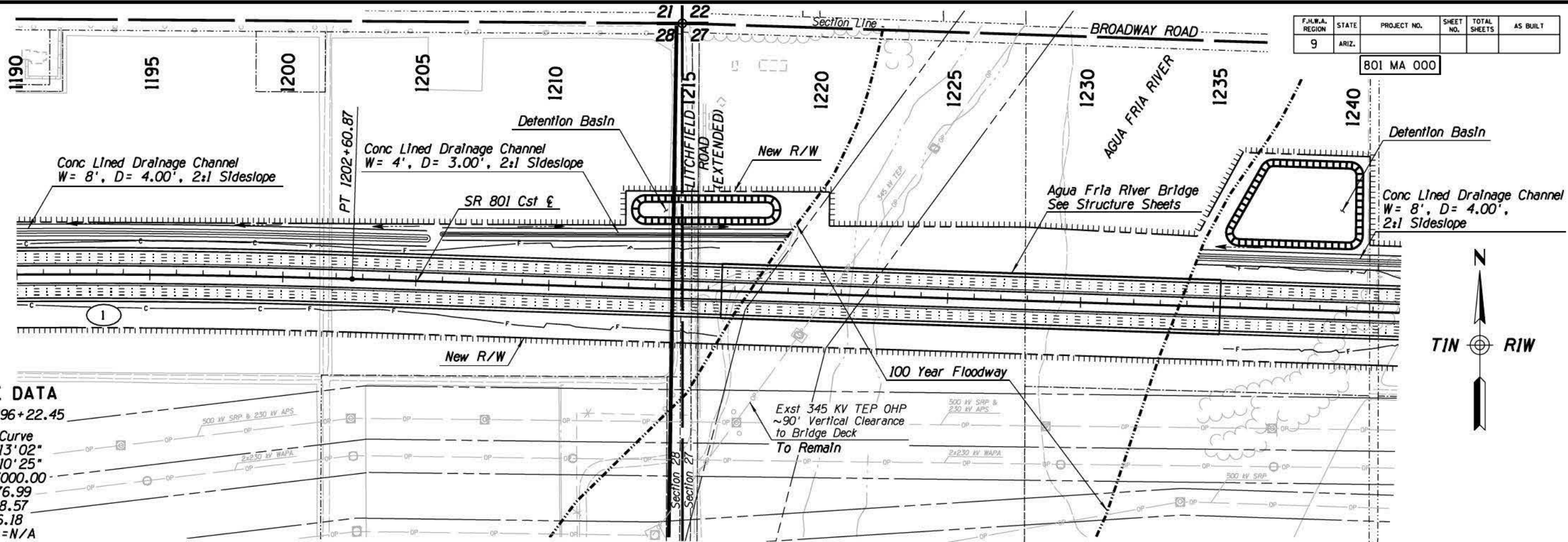
DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		AH	08/07		
CHECKED		BB	08/07		
ROUTE		SR 801		SR 801 (SR 303L TO SR 202L)	DWG NO 241-08
LOCATION		SR 801			
TRACS NO.		H6876 OIL		A20 OF A184	



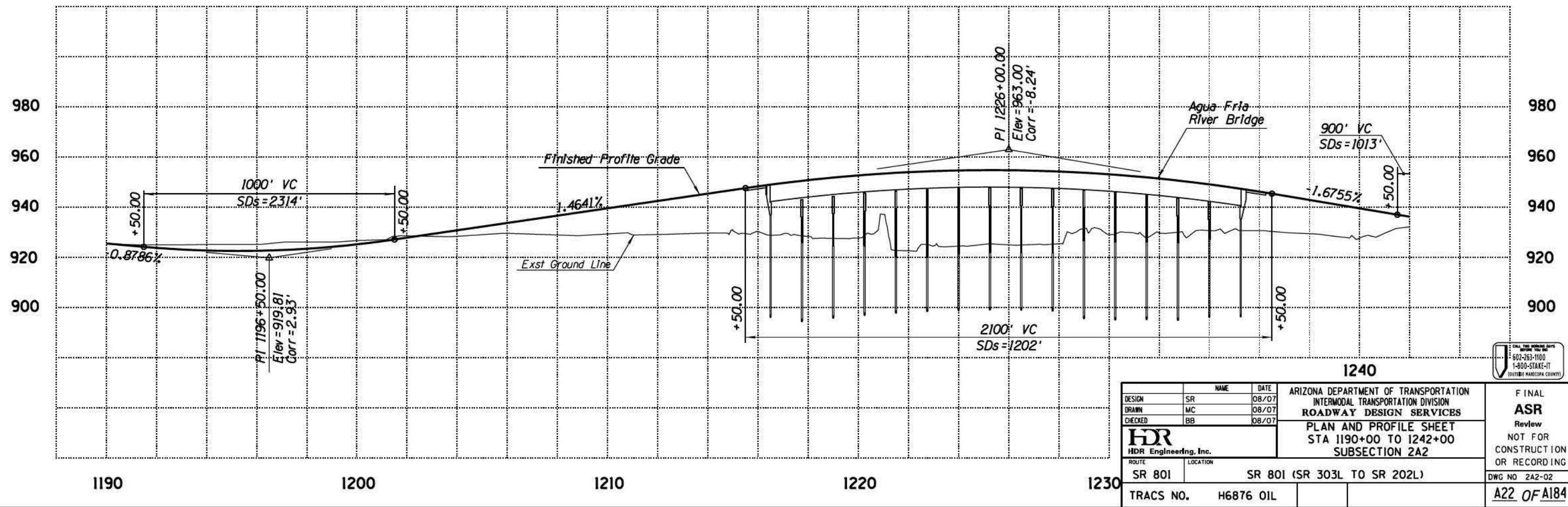


F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

BOI MA 000



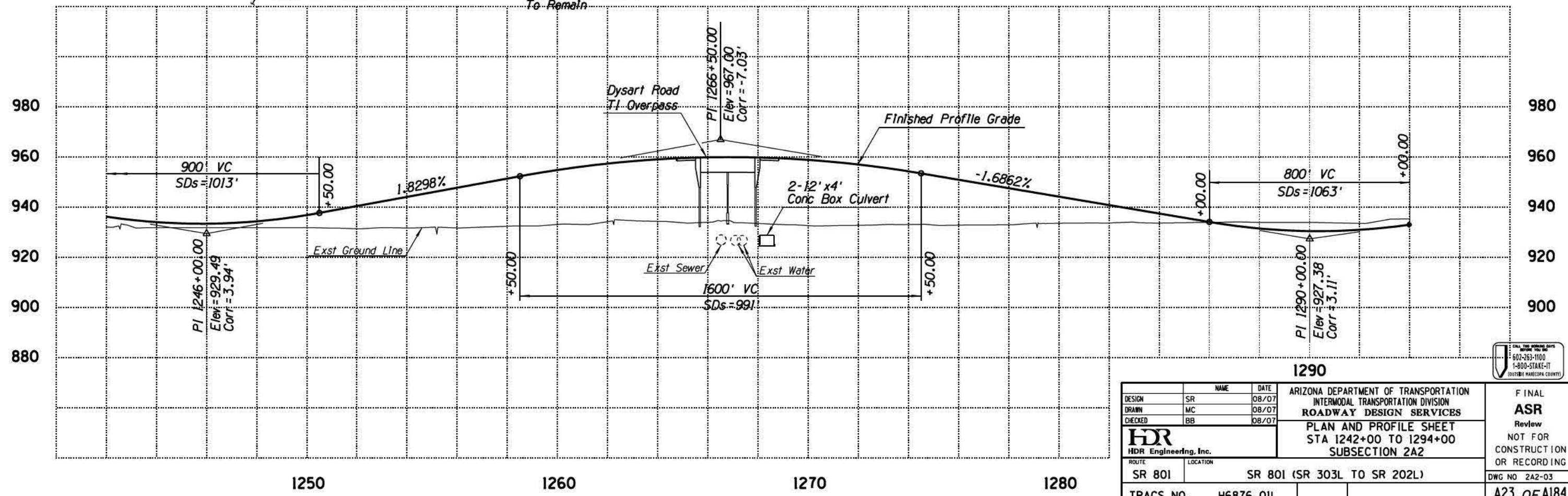
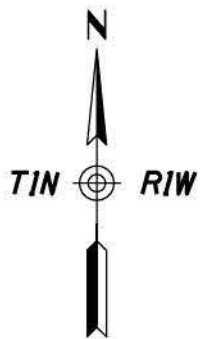
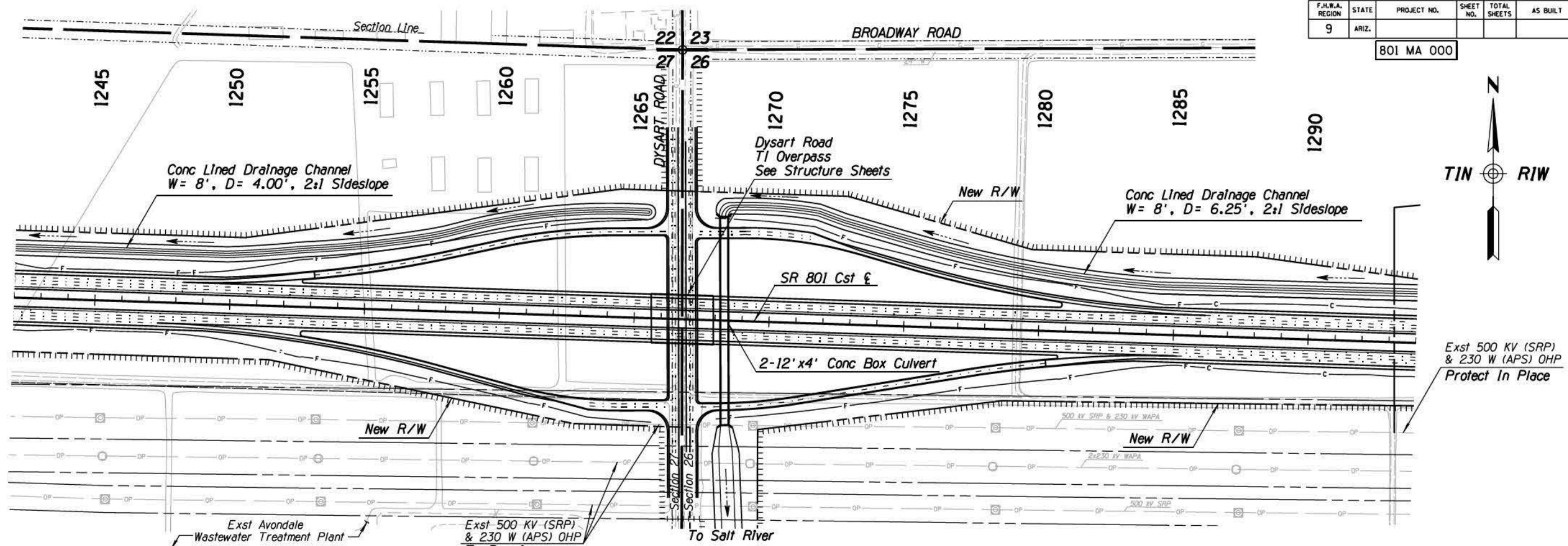
**1 CURVE DATA**  
 PI Sta 1196+22.45  
 Main Curve  
 $\Delta = 2^\circ 13' 02''$   
 $D = 0^\circ 10' 25''$   
 $R = 33000.00'$   
 $L = 1276.99'$   
 $T = 638.57'$   
 $Ext = 6.18'$   
 Super = N/A



DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		MC	08/07		
CHECKED		BB	08/07		
ROUTE		SR 801		PLAN AND PROFILE SHEET STA 1190+00 TO 1242+00 SUBSECTION 2A2	
LOCATION		SR 801 (SR 303L TO SR 202L)		DWG NO 2A2-02	
TRACS NO.		H6876 OIL		A22 OF A184	

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



DESIGN	SR	DATE	08/07
DRAWN	MC	DATE	08/07
CHECKED	BB	DATE	08/07

**HDR**  
HDR Engineering, Inc.

ARIZONA DEPARTMENT OF TRANSPORTATION  
INTERMODAL TRANSPORTATION DIVISION  
ROADWAY DESIGN SERVICES

PLAN AND PROFILE SHEET  
STA 1242+00 TO 1294+00  
SUBSECTION 2A2

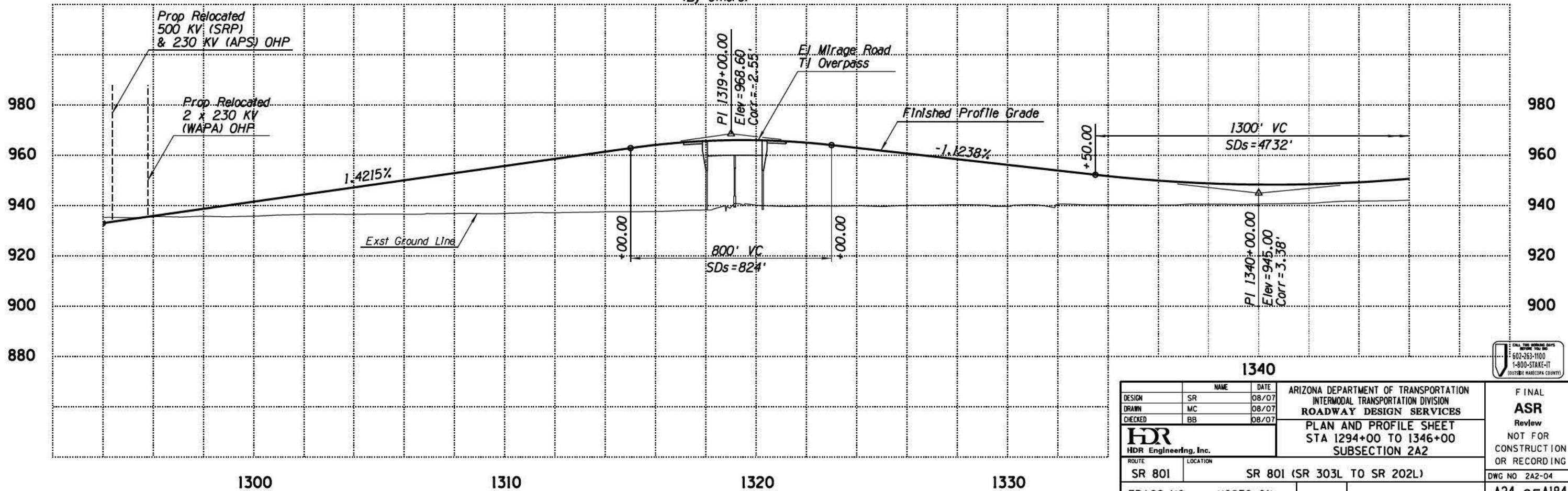
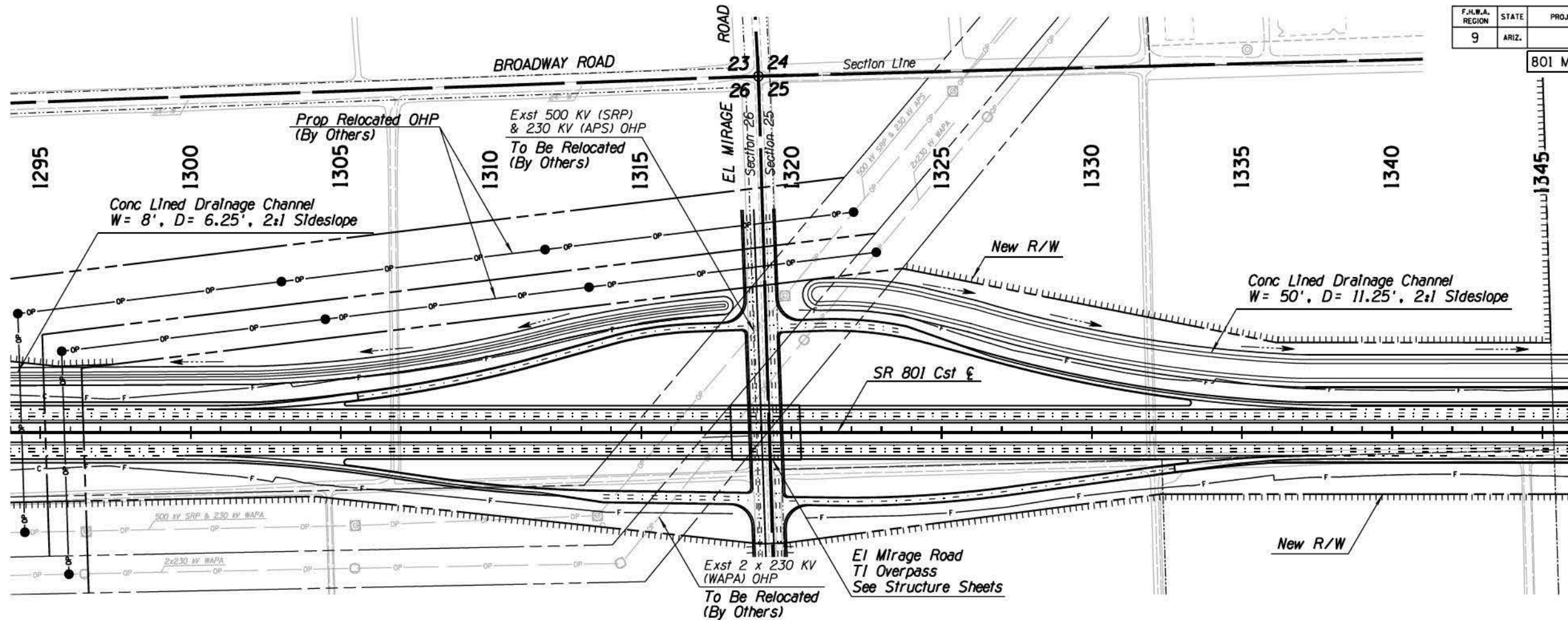
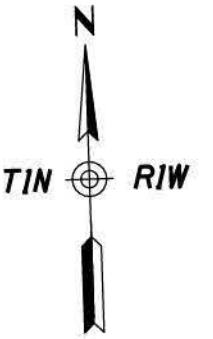
FINAL  
**ASR**  
Review  
NOT FOR  
CONSTRUCTION  
OR RECORDING

DWG NO 2A2-03  
**A23 OF A184**

ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)
TRACS NO.	H6876 OIL		

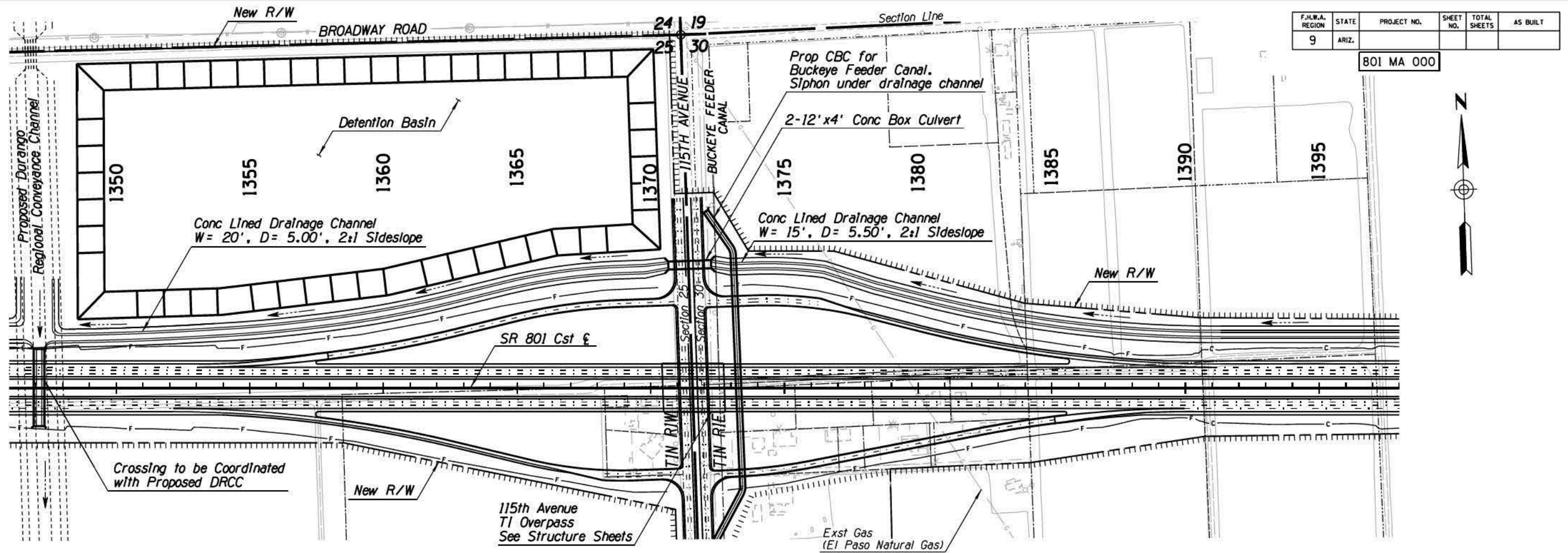
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



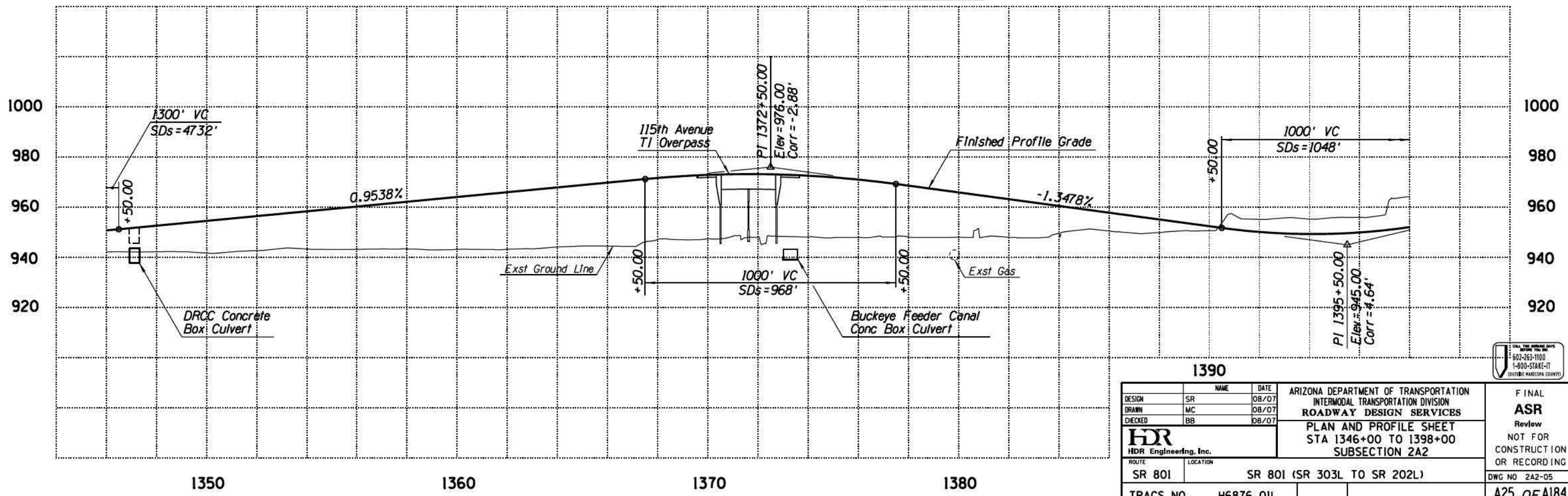
DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		MC	08/07		
CHECKED		BB	08/07		
ROUTE		SR 801		SR 801 (SR 303L TO SR 202L)	DWG NO 2A2-04
LOCATION		SR 801 (SR 303L TO SR 202L)			
TRACS NO.		H6876 OIL		A24 OF A184	

DATE: LOCATION: REVISIONS: FINISHED PLANS: SURVEY NO.



F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

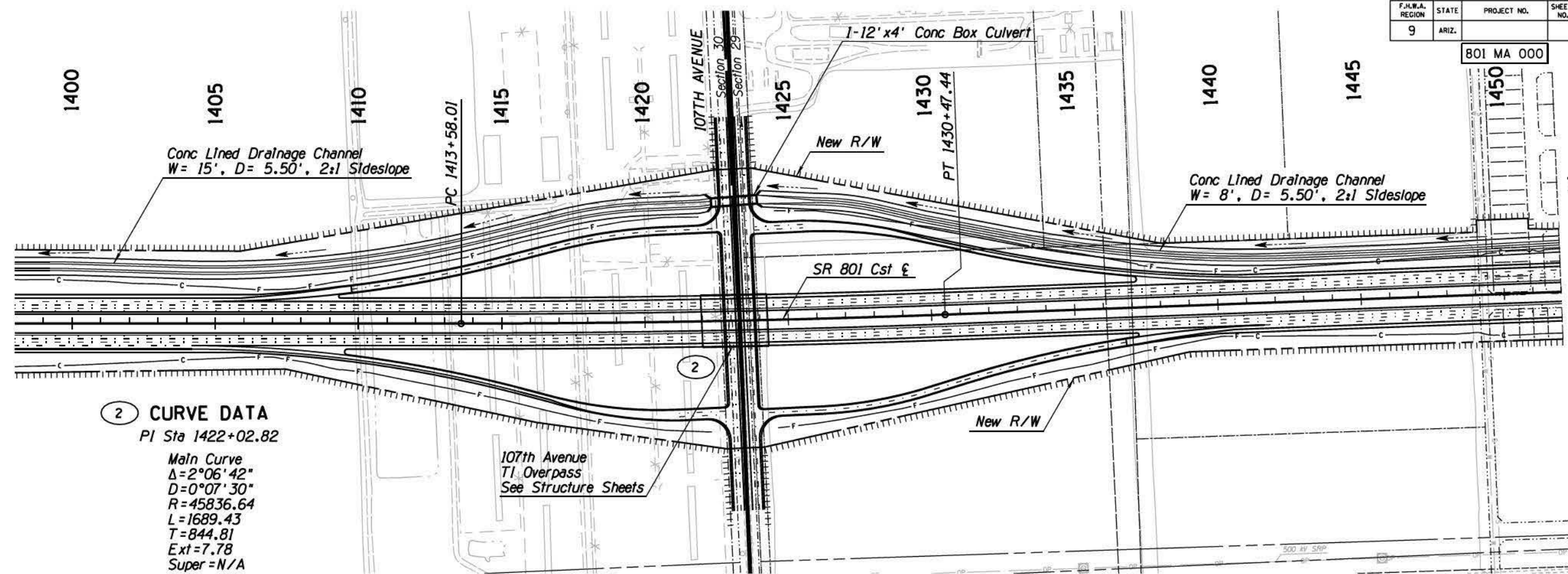
BOI MA 000



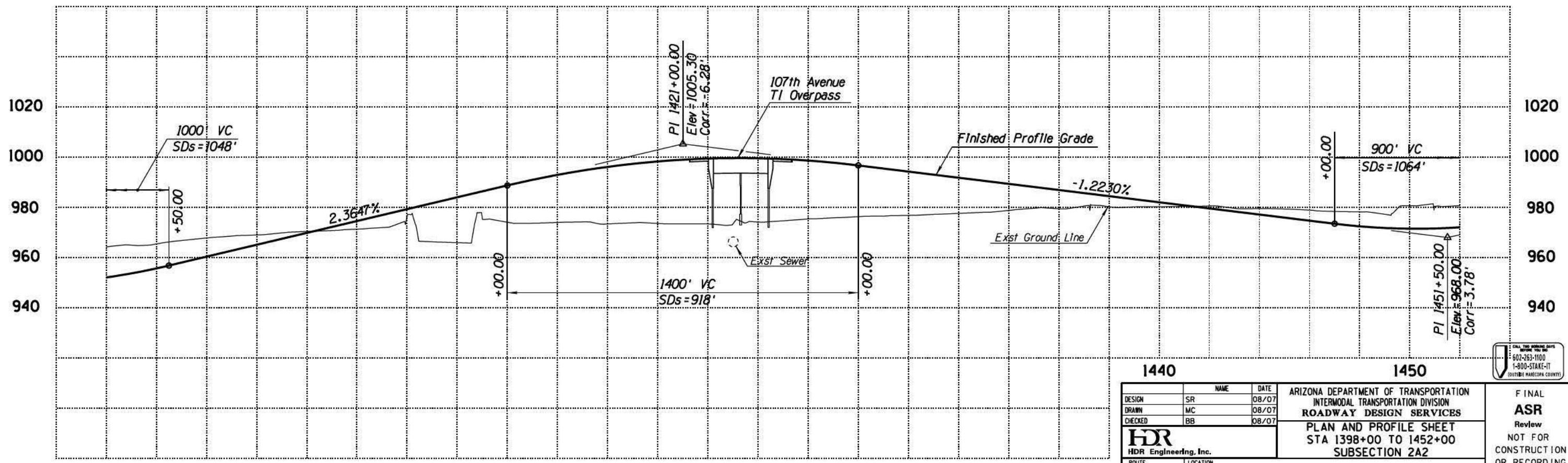
DESIGN	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL ASR Review NOT FOR CONSTRUCTION OR RECORDING	
DRAWN	MC	08/07			PLAN AND PROFILE SHEET STA 1346+00 TO 1398+00 SUBSECTION 2A2
CHECKED	BB	08/07			
			SR 801 (SR 303L TO SR 202L)	DWG NO 2A2-05	
ROUTE: SR 801			TRACS NO. H6876 OIL	A25 OF A184	

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

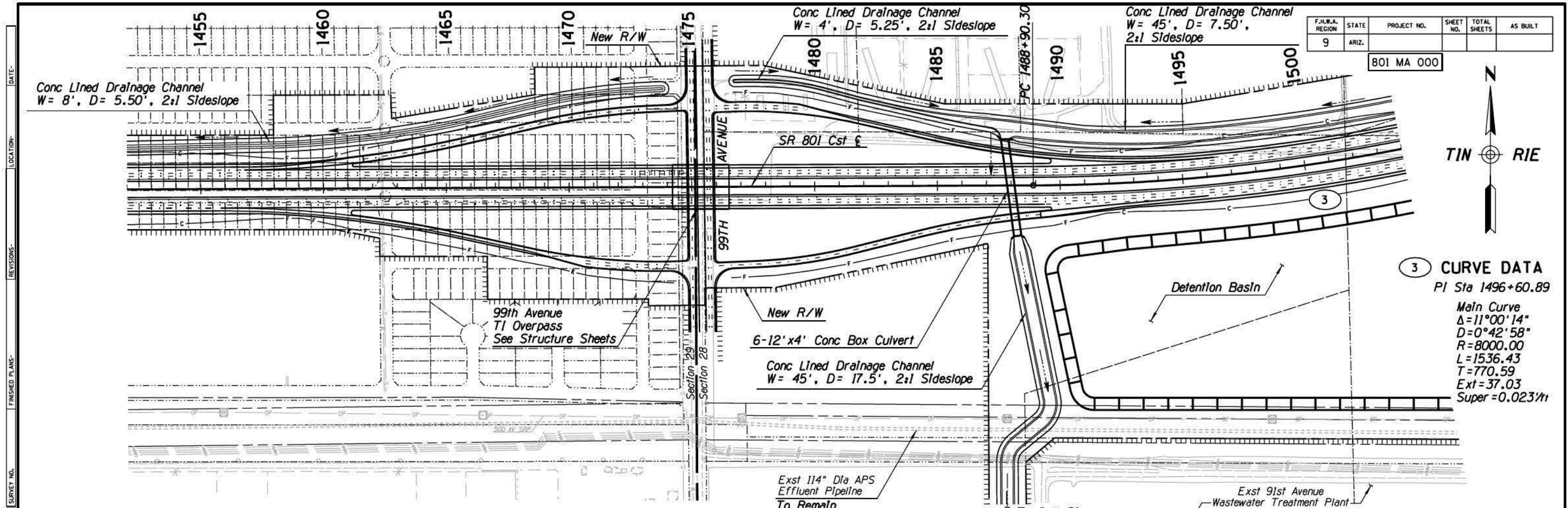
801 MA 000



**2 CURVE DATA**  
 PI Sta 1422+02.82  
 Main Curve  
 $\Delta = 2^{\circ}06'42''$   
 $D = 0^{\circ}07'30''$   
 $R = 45836.64$   
 $L = 1689.43$   
 $T = 844.81$   
 $Ext = 7.78$   
 $Super = N/A$

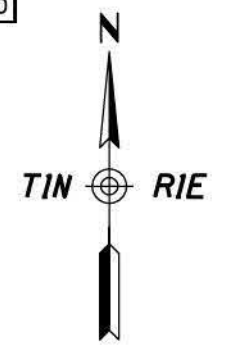


1440		1450		ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b> PLAN AND PROFILE SHEET STA 1398+00 TO 1452+00 SUBSECTION 2A2	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING DWG NO 2A2-06 <b>A26 OF A184</b>
DESIGN	SR	DATE	08/07		
DRAWN	MC	DATE	08/07		
CHECKED	BB	DATE	08/07		
<b>HDR</b> HDR Engineering, Inc.		ROUTE: SR 801 LOCATION: SR 801 (SR 303L TO SR 202L)			
TRACS NO.		H6876 OIL			

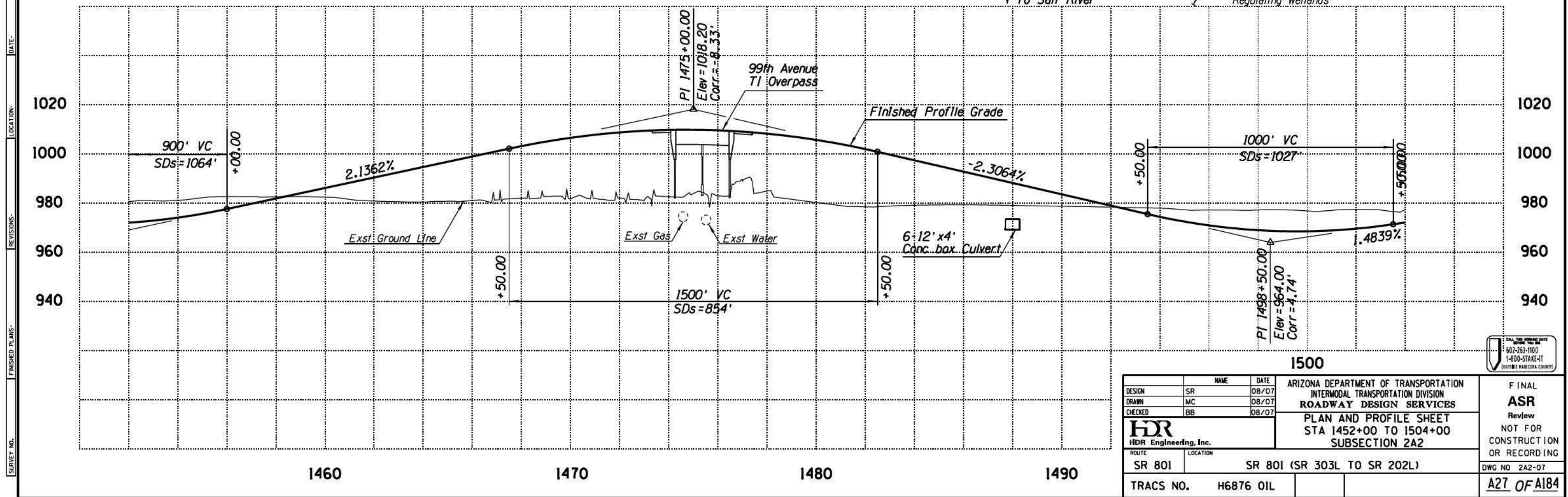


F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



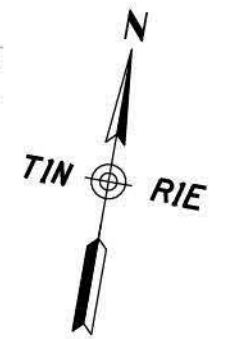
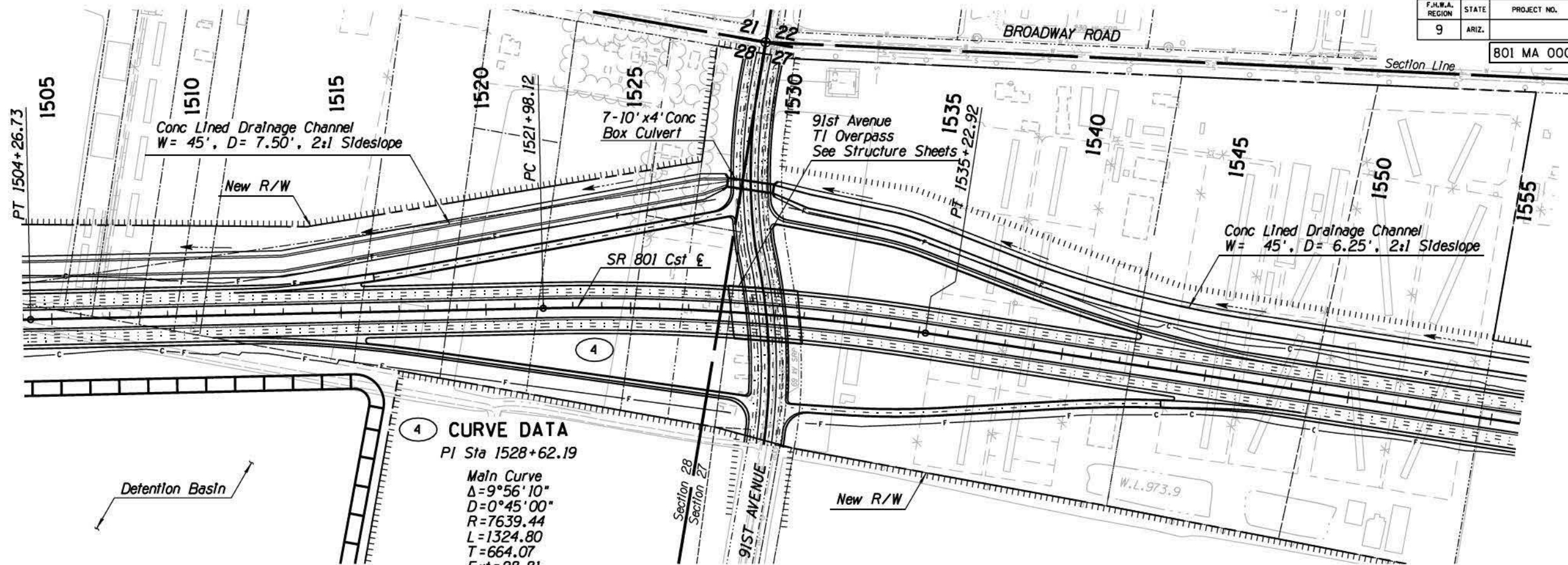
**3 CURVE DATA**  
 PI Sta 1496+60.89  
 Main Curve  
 $\Delta = 11^{\circ}00'14''$   
 $D = 0^{\circ}42'58''$   
 $R = 8000.00$   
 $L = 1536.43$   
 $T = 770.59$   
 $Ext = 37.03$   
 $Super = 0.023'/ft$



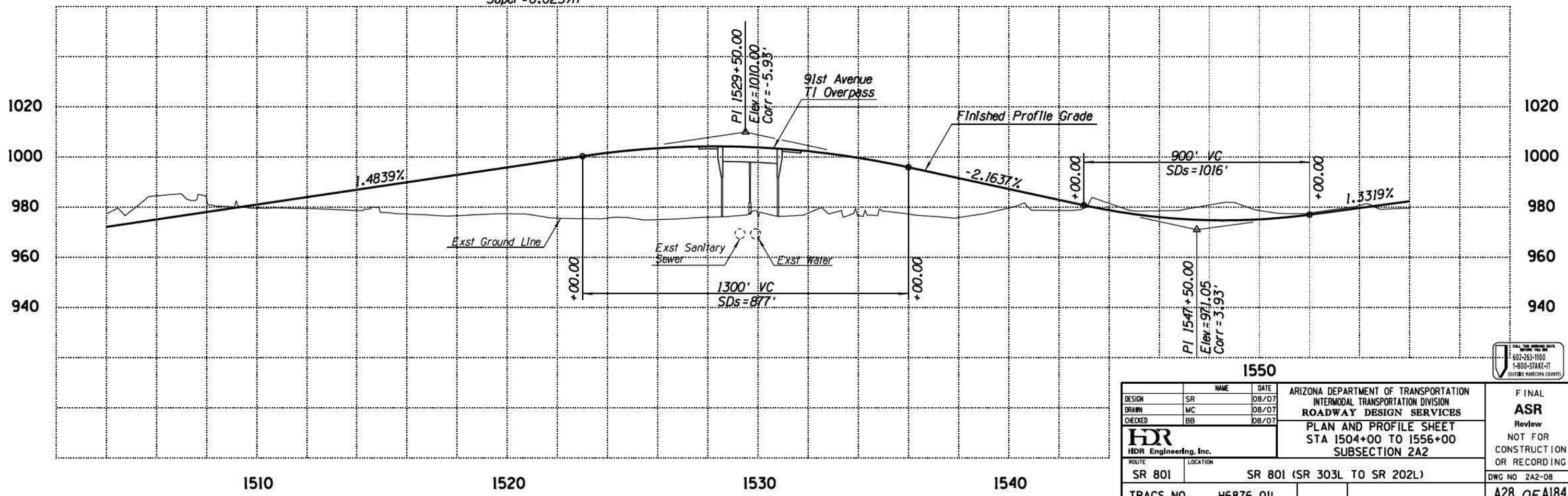
DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	MC	DATE	08/07		
CHECKED	BB	DATE	08/07		
ROUTE		LOCATION		SR 801 SR 303L TO SR 202L	
TRACS NO.		H6876 OIL		DWG NO 2A2-07	
				A27 OF A184	

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



**4 CURVE DATA**  
 PI Sta 1528+62.19  
 Main Curve  
 $\Delta = 9^\circ 56' 10''$   
 $D = 0^\circ 45' 00''$   
 $R = 7639.44$   
 $L = 1324.80$   
 $T = 664.07$   
 $Ext = 28.81$   
 $Super = 0.023'/ft$



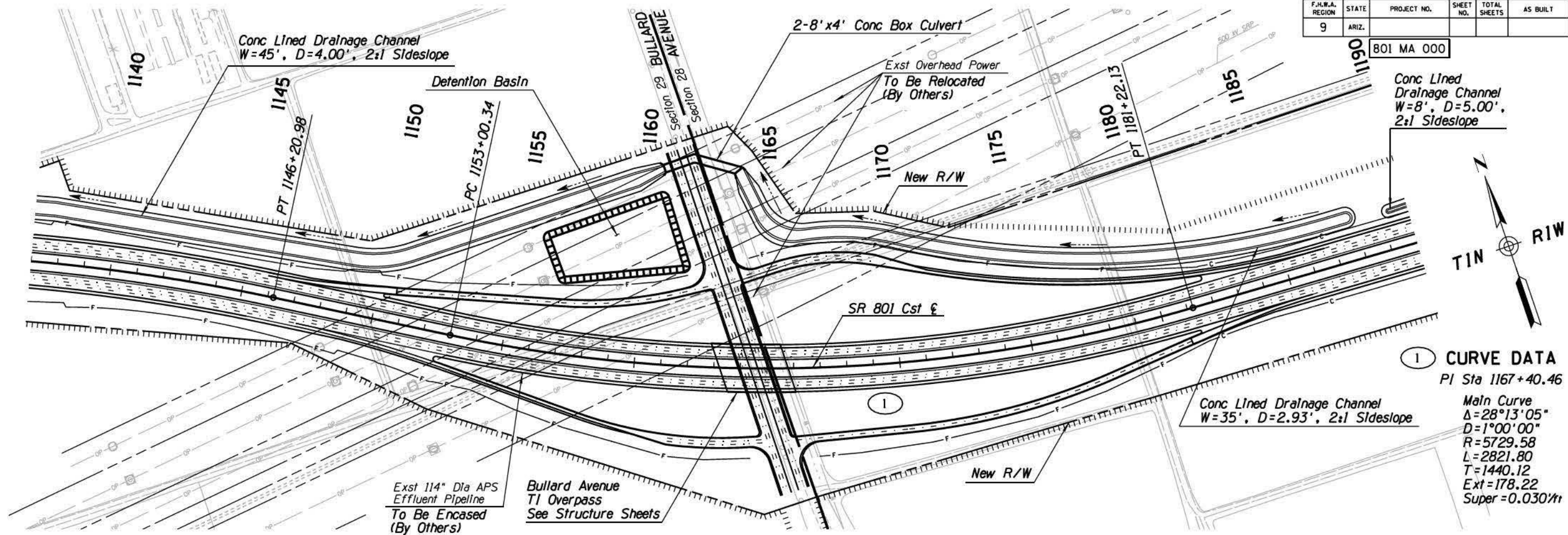
DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		MC	08/07		
CHECKED		BB	08/07		
ROUTE		SR 801		PLAN AND PROFILE SHEET STA 1504+00 TO 1556+00 SUBSECTION 2A2	DWG NO 2A2-08
LOCATION		SR 801 (SR 303L TO SR 202L)			
TRACS NO.		H6876 OIL		A28 OF A184	



DATE: LOCATION: REVISIONS: FINISHED PLANS: SURVEY NO.

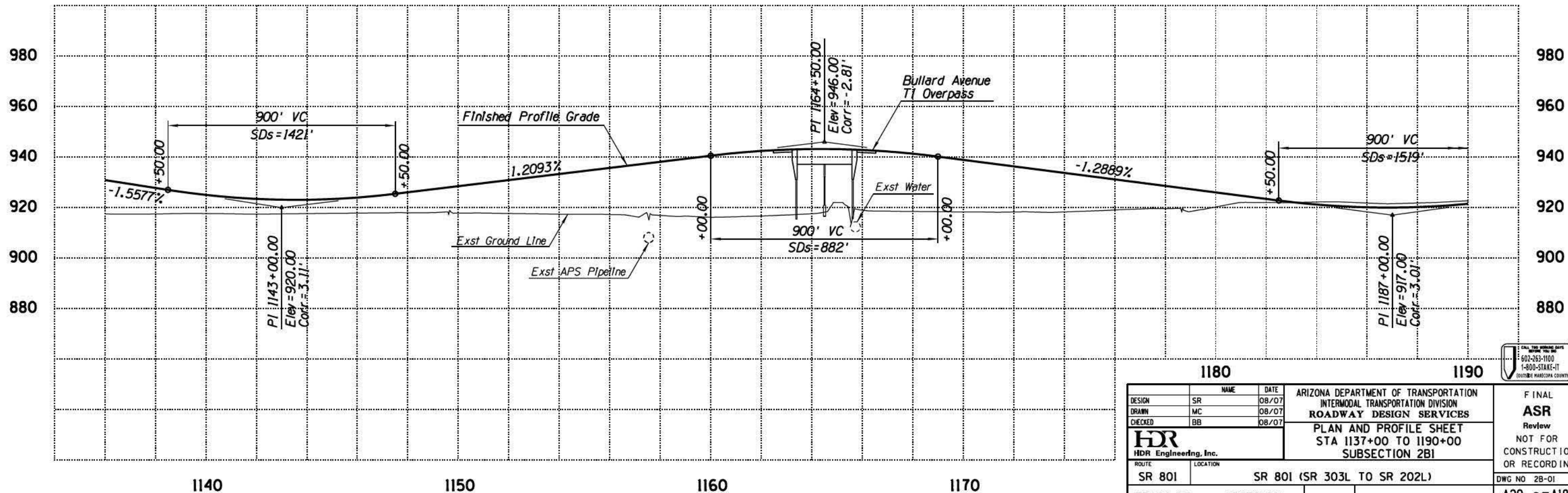
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

BOI MA 000



**1 CURVE DATA**  
PI Sta 1167+40.46

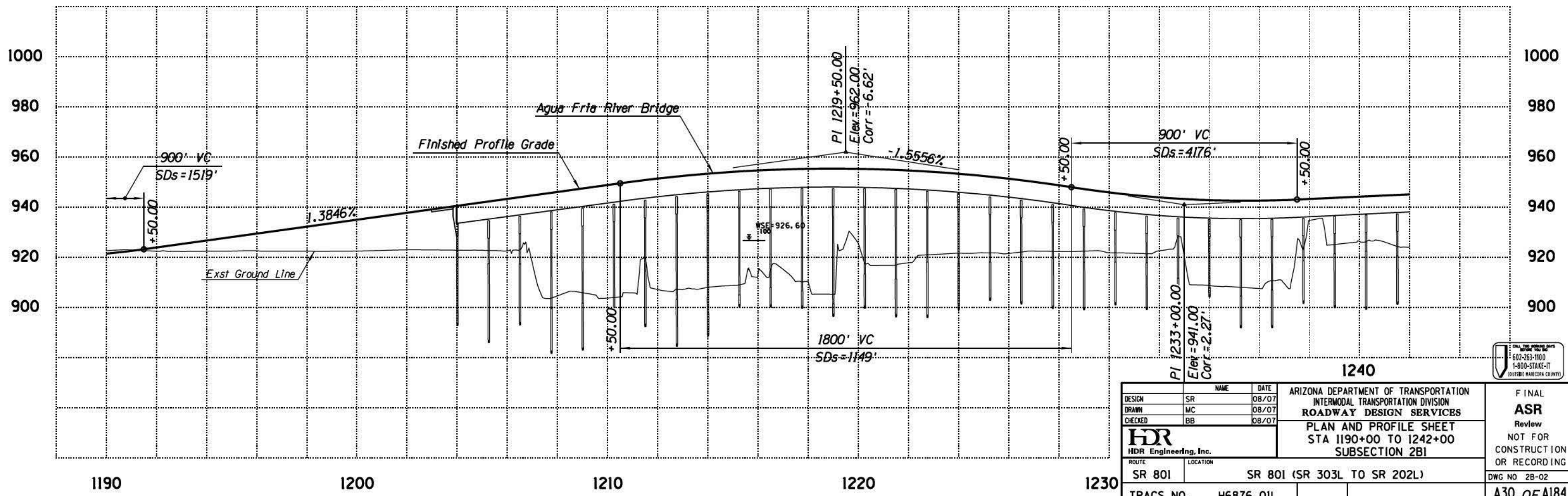
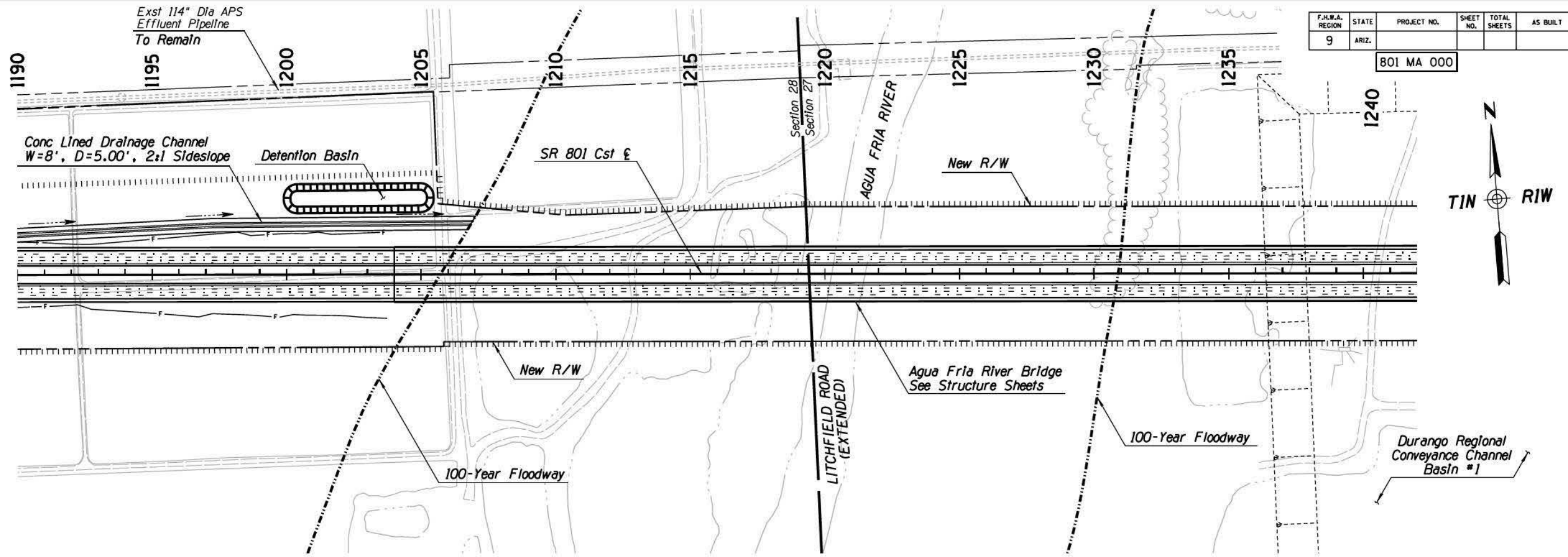
Main Curve  
 $\Delta = 28^{\circ}13'05''$   
 $D = 1^{\circ}00'00''$   
 $R = 5729.58$   
 $L = 2821.80$   
 $T = 1440.12$   
 $Ext = 178.22$   
 $Super = 0.030'/ft$



DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		MC	08/07		
CHECKED		BB	08/07		
ROUTE		SR 801		SR 801 (SR 303L TO SR 202L)	
LOCATION		SR 801		SR 801 (SR 303L TO SR 202L)	
TRACS NO.		H6876 OIL		A29 OF A184	

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

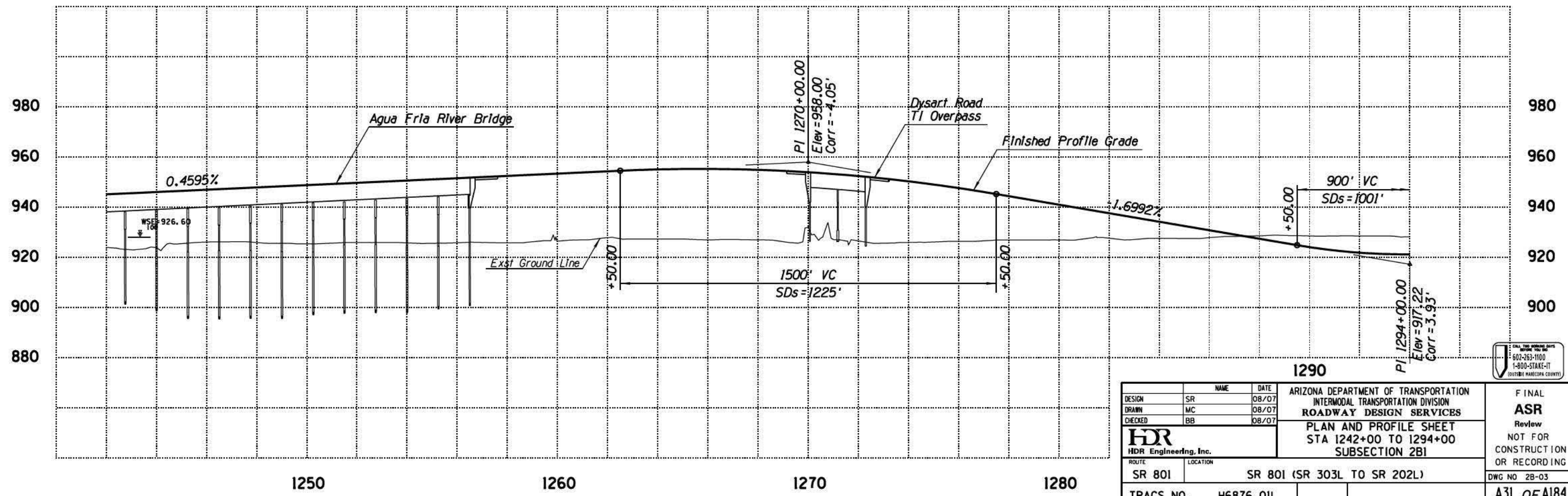
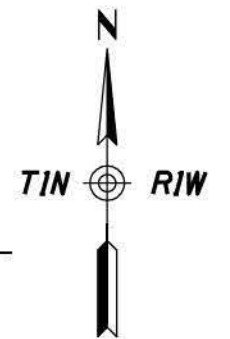
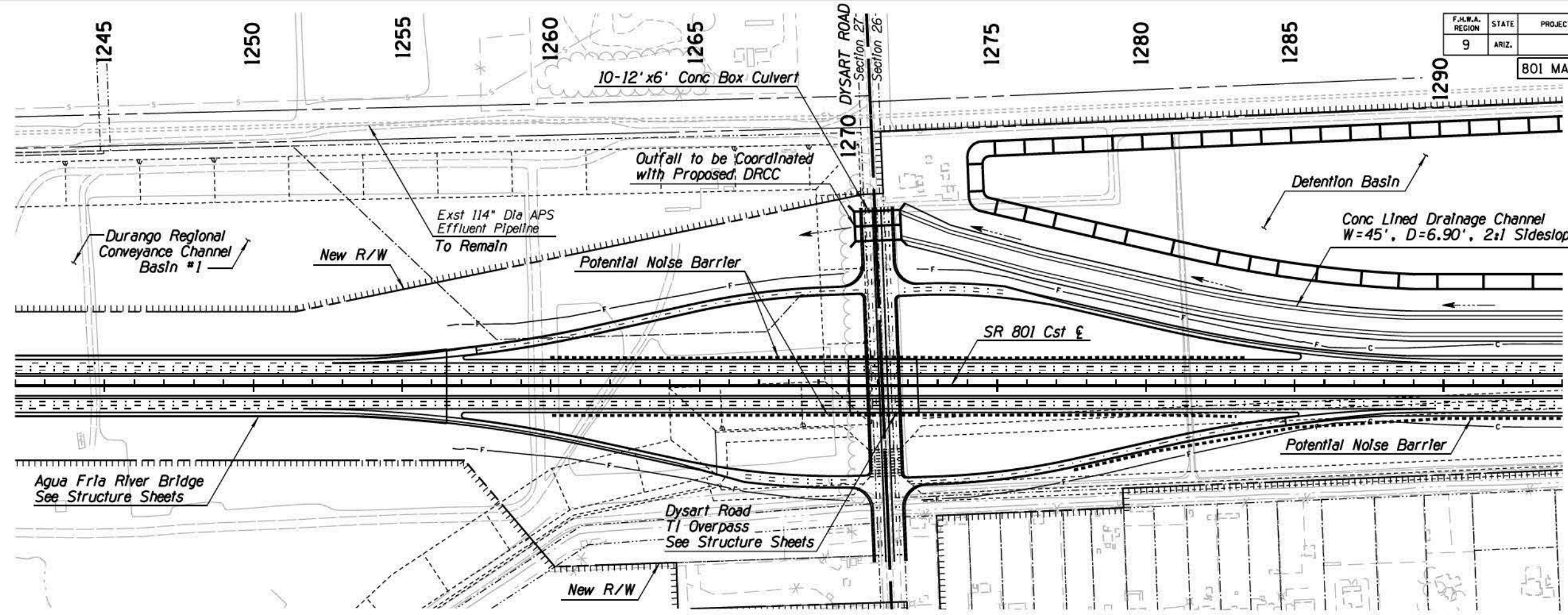
801 MA 000



DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	MC	DATE	08/07		
CHECKED	BB	DATE	08/07		
				PLAN AND PROFILE SHEET STA 1190+00 TO 1242+00 SUBSECTION 2B1	
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)		
TRACS NO.	H6876 OIL				DWG NO 28-02
					A30 OF A184

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



DESIGN	SR	DATE	08/07
DRAWN	MC	DATE	08/07
CHECKED	BB	DATE	08/07

ARIZONA DEPARTMENT OF TRANSPORTATION  
 INTERMODAL TRANSPORTATION DIVISION  
**ROADWAY DESIGN SERVICES**  
 PLAN AND PROFILE SHEET  
 STA 1242+00 TO 1294+00  
 SUBSECTION 2B1

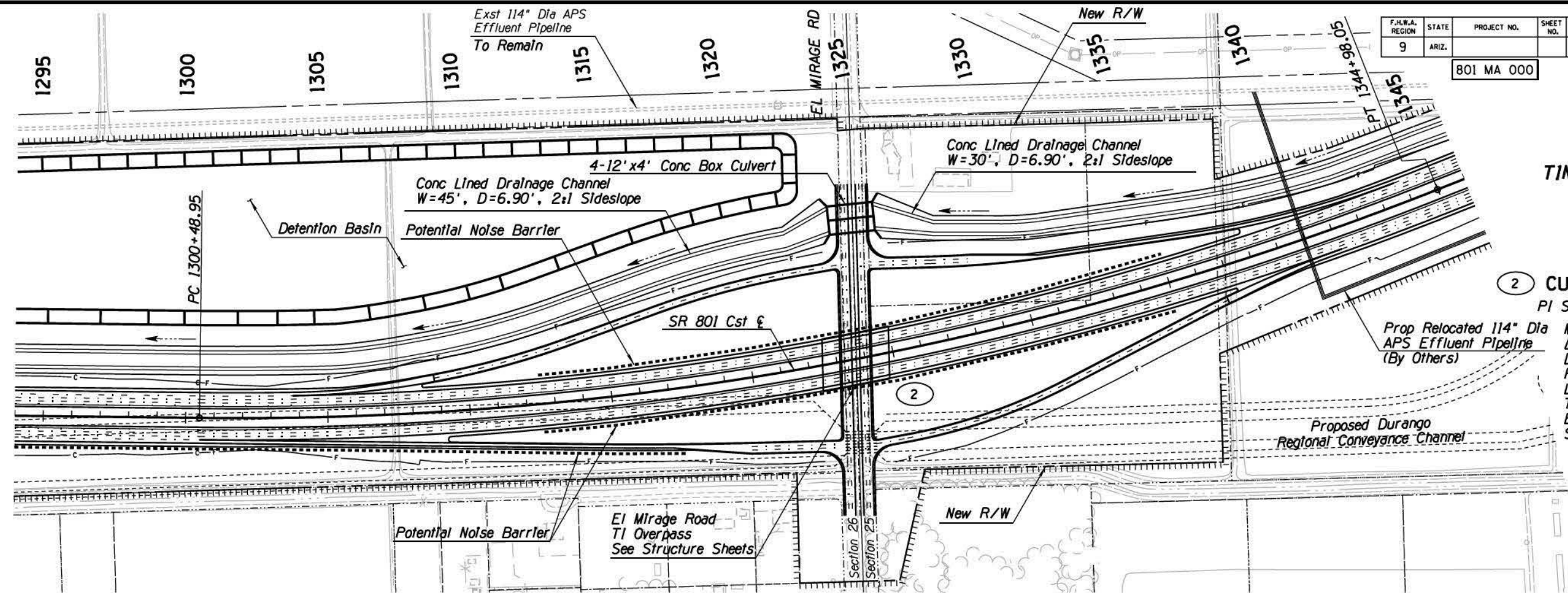
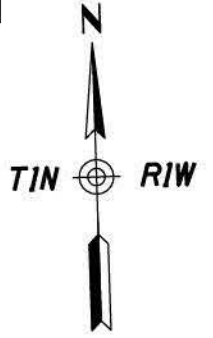
FINAL  
**ASR**  
 Review  
 NOT FOR  
 CONSTRUCTION  
 OR RECORDING  
 DWG NO 28-03  
**A31 OF A184**

ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)
TRACS NO.	H6876 OIL		

DATE: LOCATION: REVISIONS: FINISHED PLANS: SURVEY NO.

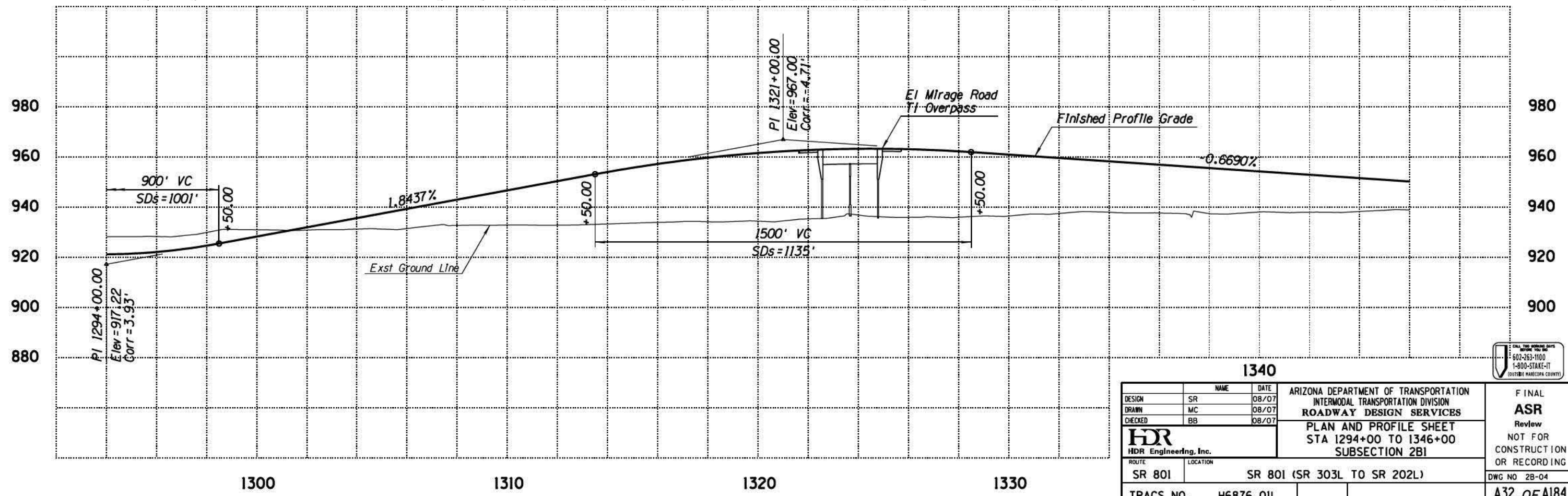
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



**2 CURVE DATA**  
PI Sta 1323+01.87

Main Curve	$\Delta = 22^\circ 14' 45''$
	$D = 0^\circ 30' 00''$
	$R = 11459.00$
	$L = 4449.09$
	$T = 2252.92$
	$Ext = 219.37$
	$Super = N/A$

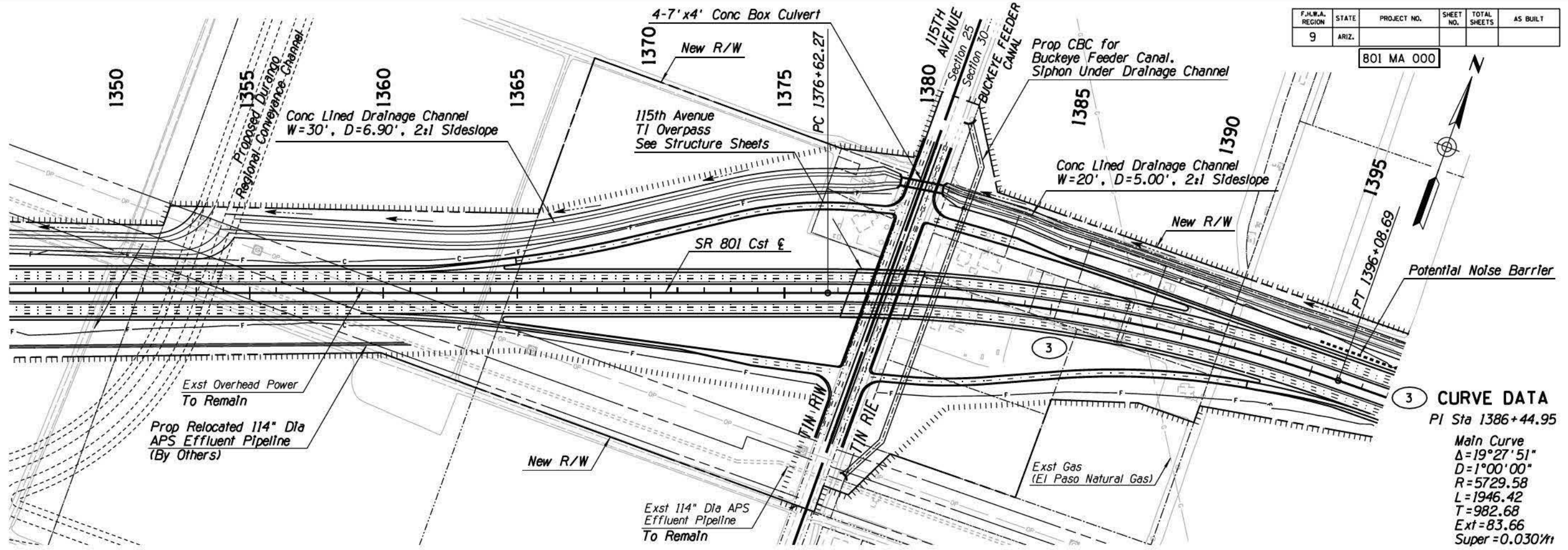


DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		MC	08/07		
CHECKED		BB	08/07		
ROUTE		SR 801		SR 801 (SR 303L TO SR 202L)	
LOCATION		SR 801		SR 801 (SR 303L TO SR 202L)	
TRACS NO.		H6876 OIL		DWG NO 28-04	
				A32 OF A184	

DATE: LOCATION: REVISIONS: FINISHED PLANS: SURVEY NO.

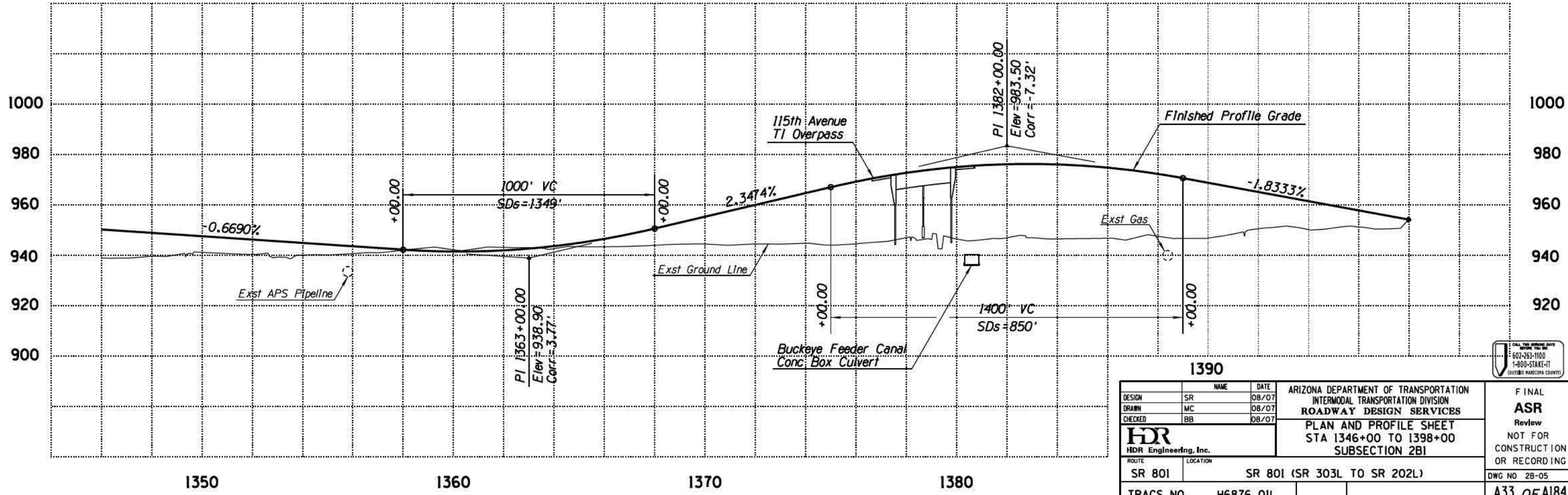
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

BOI MA 000



**3 CURVE DATA**  
 PI Sta 1386+44.95

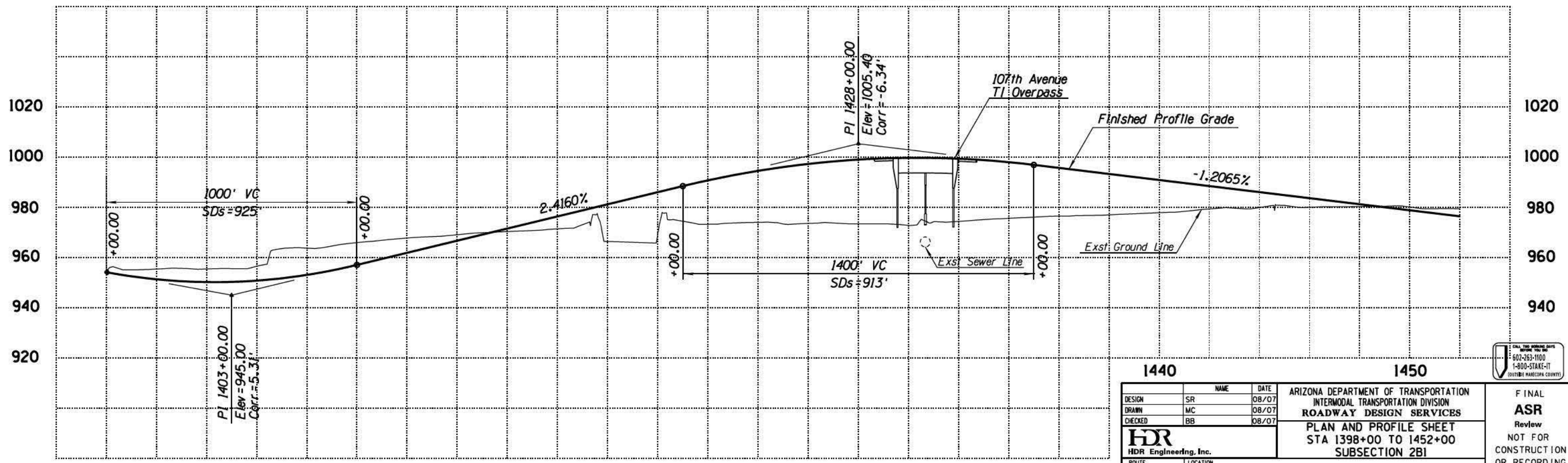
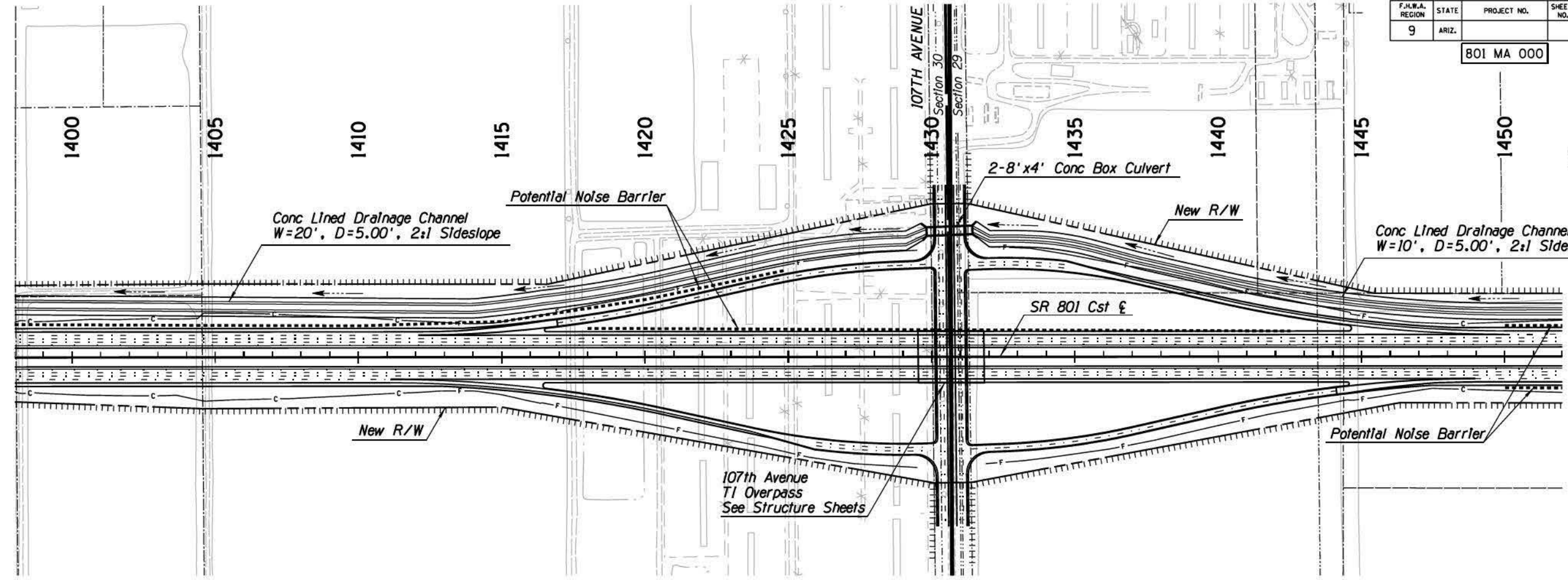
Main Curve  
 $\Delta = 19^{\circ}27'51''$   
 $D = 1^{\circ}00'00''$   
 $R = 5729.58$   
 $L = 1946.42$   
 $T = 982.68$   
 $Ext = 83.66$   
 $Super = 0.0307r$



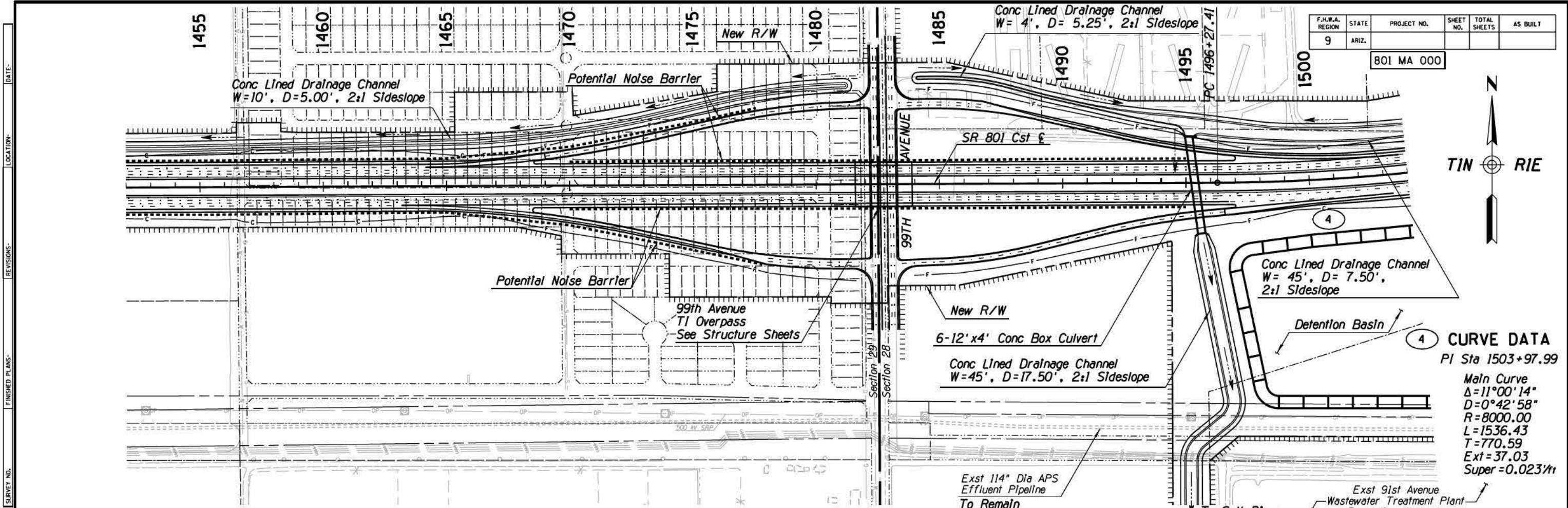
DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	MC	DATE	08/07		
CHECKED	BB	DATE	08/07		
				PLAN AND PROFILE SHEET STA 1346+00 TO 1398+00 SUBSECTION 2B1	DWG NO 28-05
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)	A33 OF A184	
TRACS NO.	H6876 OIL				

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000

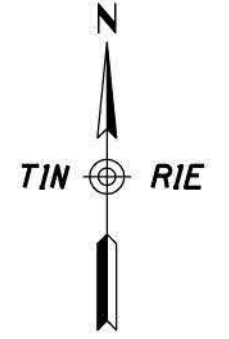


1440		1450		ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b> PLAN AND PROFILE SHEET STA 1398+00 TO 1452+00 SUBSECTION 2B1	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING DWG NO 28-06 <b>A34 OF A184</b>
DESIGN	SR	DATE	08/07		
DRAWN	MC	DATE	08/07		
CHECKED	BB	DATE	08/07		
HDR Engineering, Inc.					
ROUTE	SR 801 (SR 303L TO SR 202L)				
TRACS NO.	H6876 OIL				



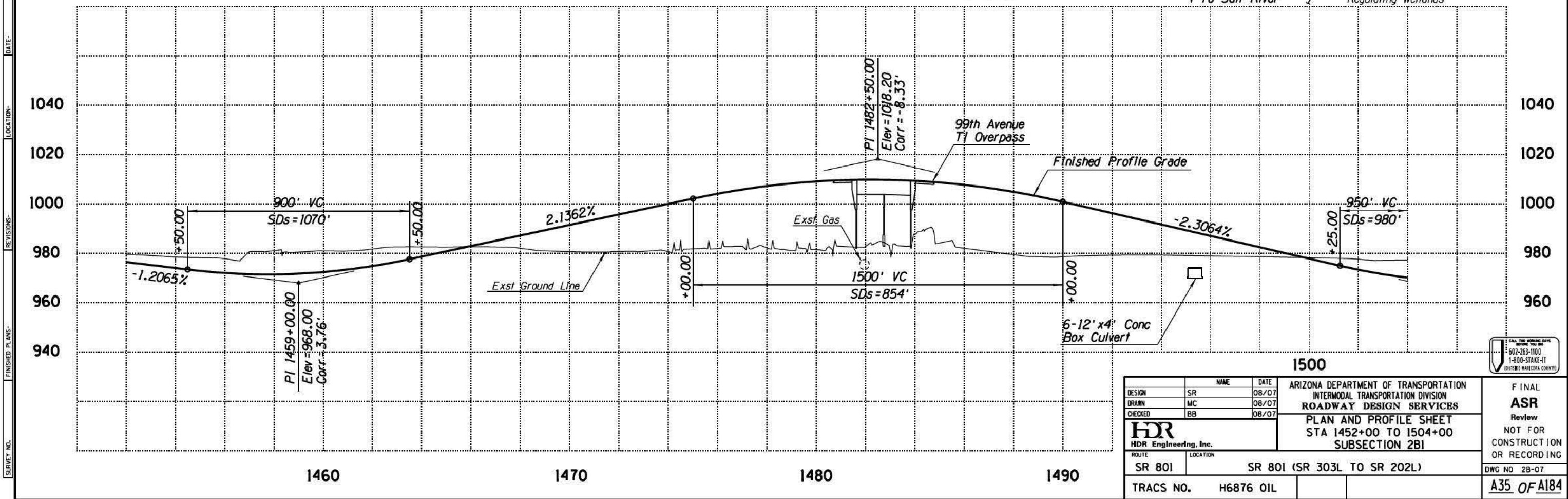
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



**CURVE DATA**  
PI Sta 1503+97.99

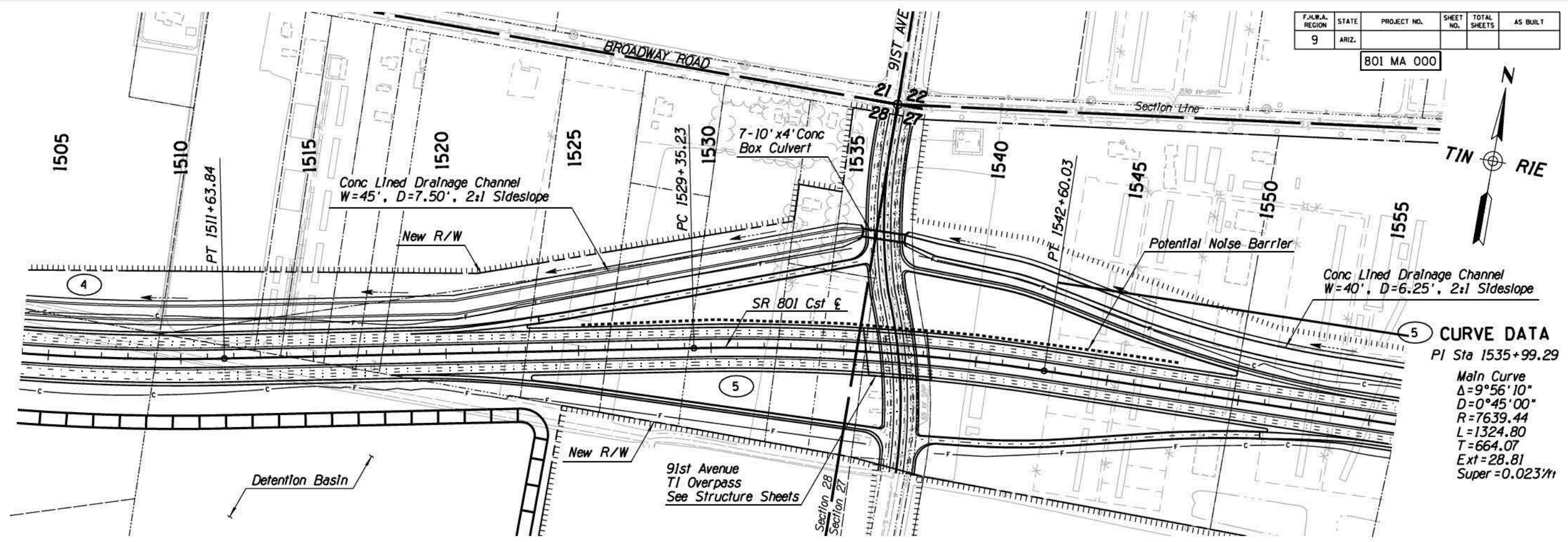
Main Curve  
 $\Delta = 11^{\circ}00'14''$   
 $D = 0^{\circ}42'58''$   
 $R = 8000.00$   
 $L = 1536.43$   
 $T = 770.59$   
 $Ext = 37.03$   
 $Super = 0.0237ft$



DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	MC	DATE	08/07		
CHECKED	BB	DATE	08/07		
<b>HDR</b> HDR Engineering, Inc.				PLAN AND PROFILE SHEET STA 1452+00 TO 1504+00 SUBSECTION 2B1	
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)	DWG NO 28-07	
TRACS NO.	H6876 OIL				A35 OF A184

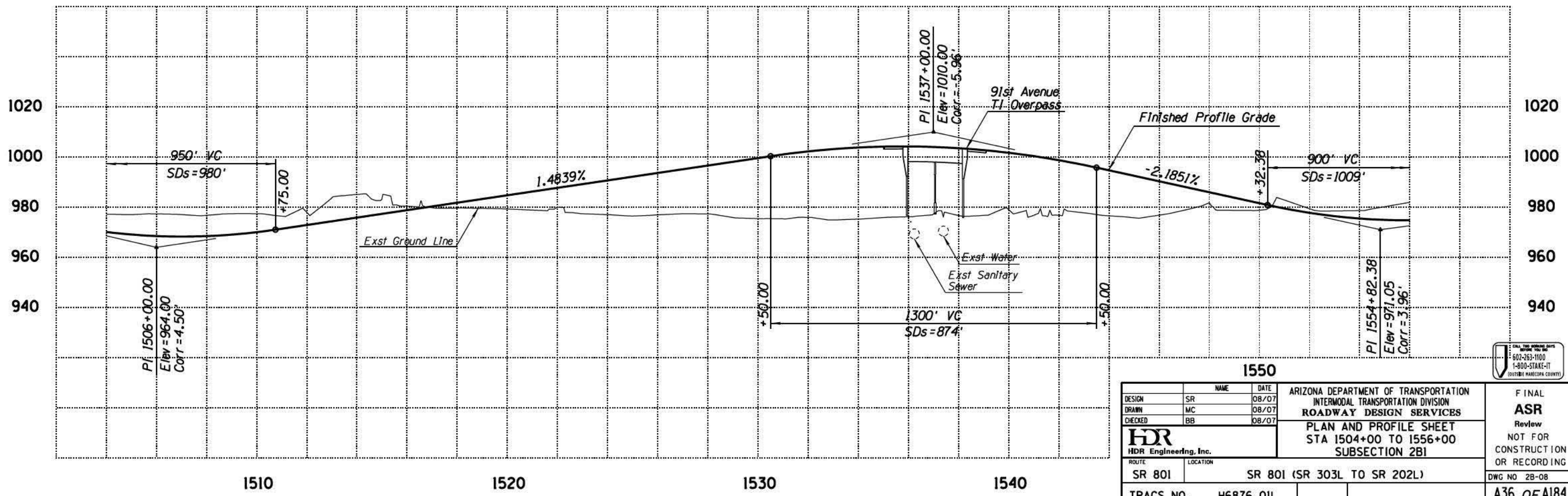
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



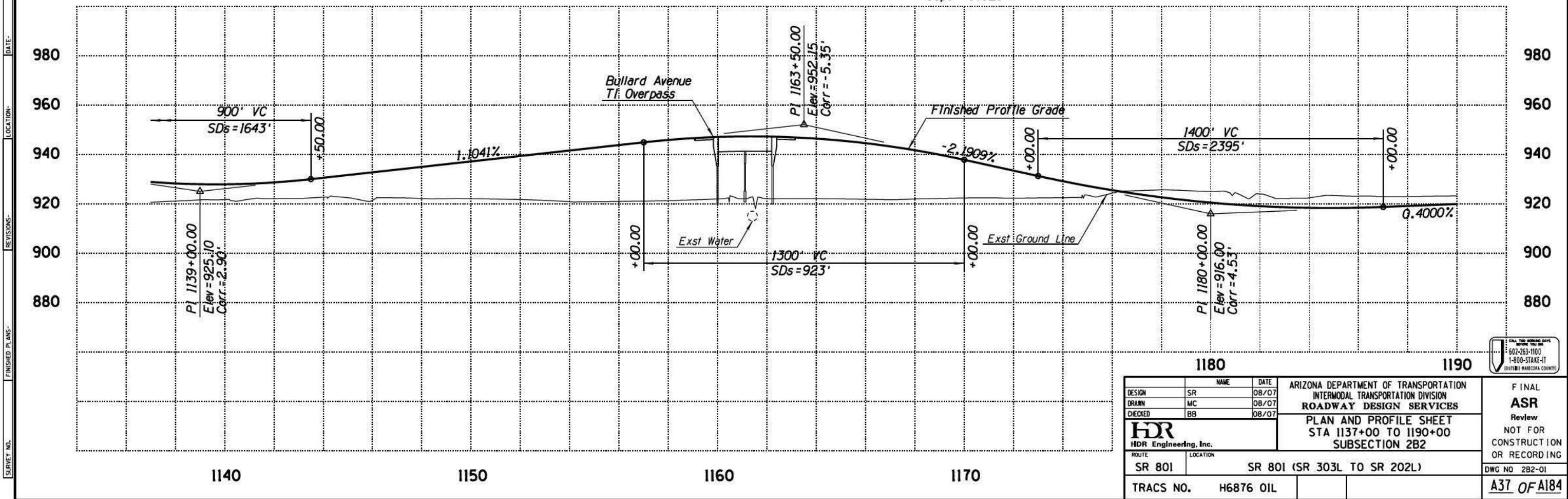
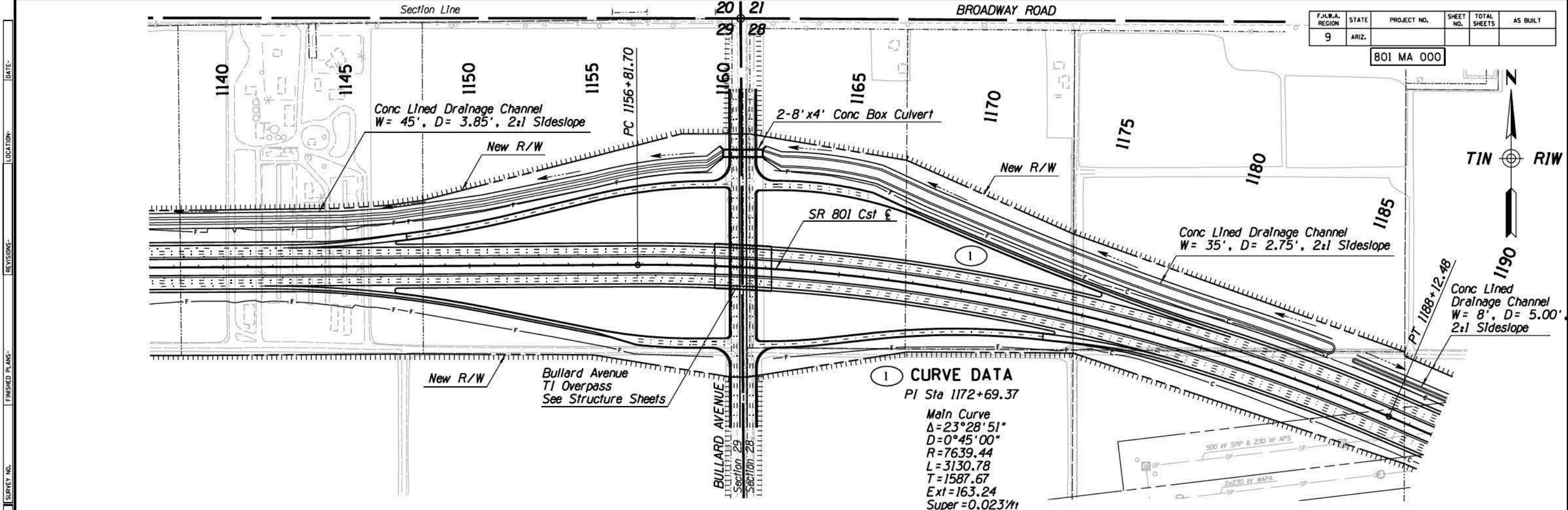
**5 CURVE DATA**  
PI Sta 1535+99.29

Main Curve  
 $\Delta = 9^{\circ}56'10''$   
 $D = 0^{\circ}45'00''$   
 $R = 7639.44$   
 $L = 1324.80$   
 $T = 664.07$   
 $Ext = 28.81$   
 $Super = 0.0237ft$



DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		MC	08/07		
CHECKED		BB	08/07		
 HDR Engineering, Inc.				PLAN AND PROFILE SHEET STA 1504+00 TO 1556+00 SUBSECTION 2B1	DWG NO 28-08
ROUTE	LOCATION	SR 801		SR 801 (SR 303L TO SR 202L)	DWG NO 28-08
TRACS NO.	H6876 OIL				<b>A36 OF A184</b>

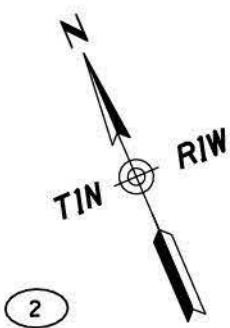
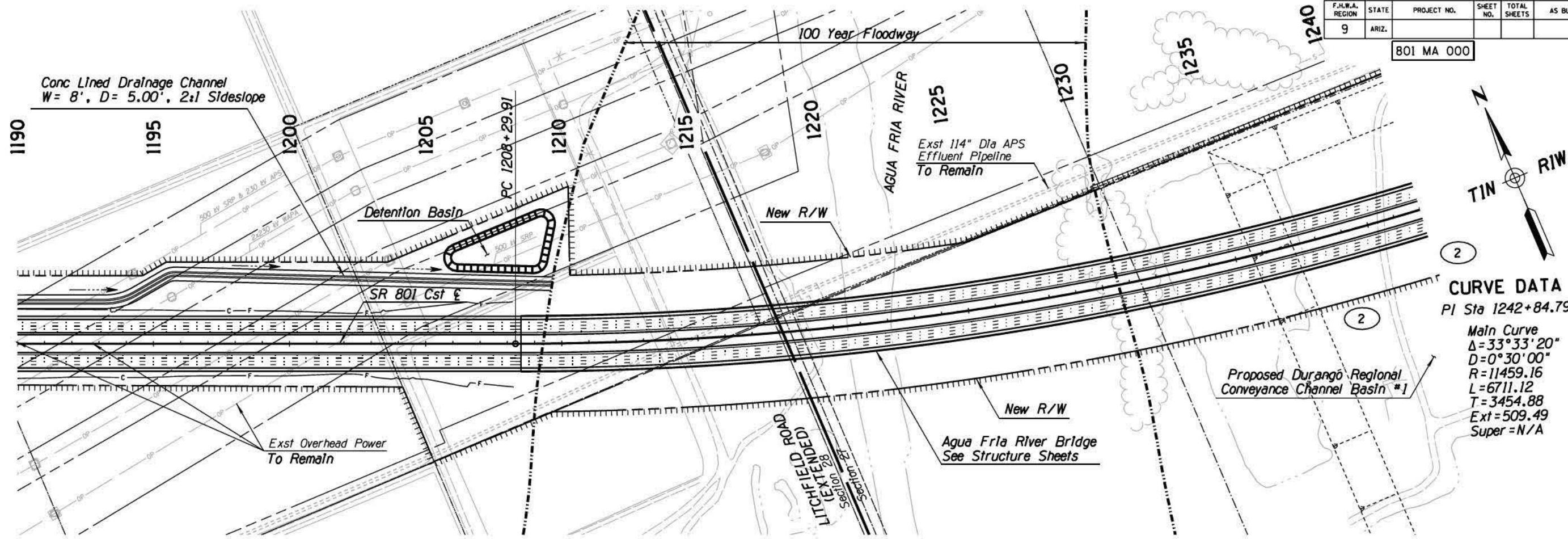




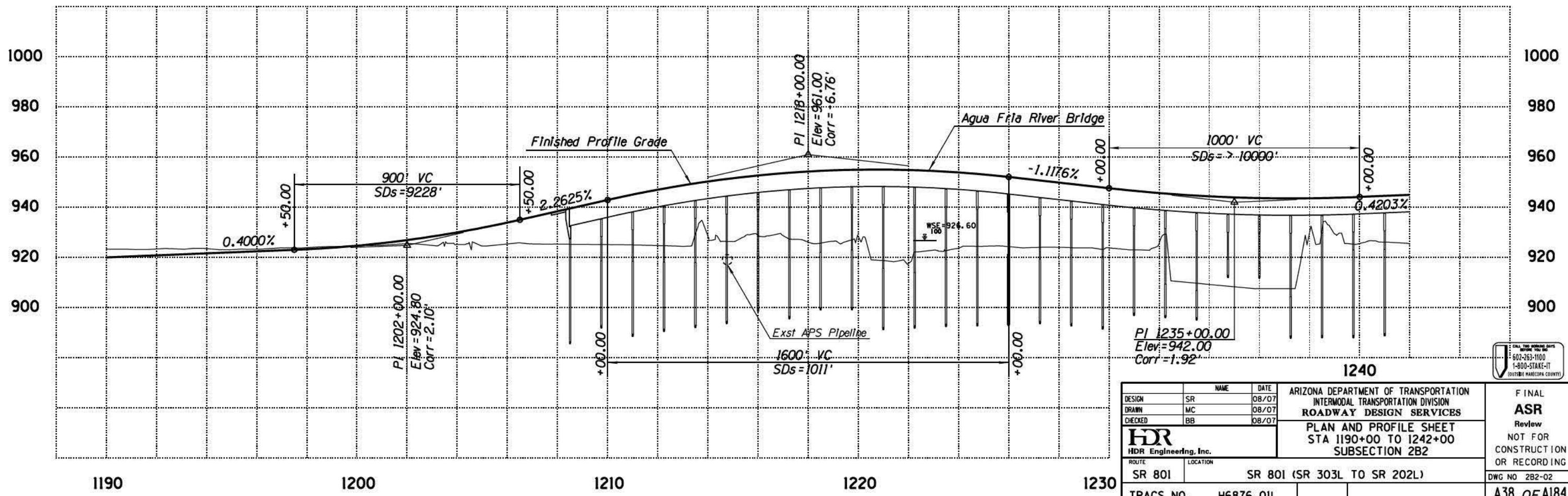
DATE: LOCATION: REVISIONS: FINISHED PLANS: SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000

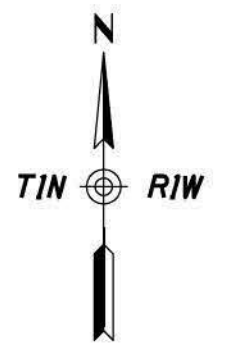
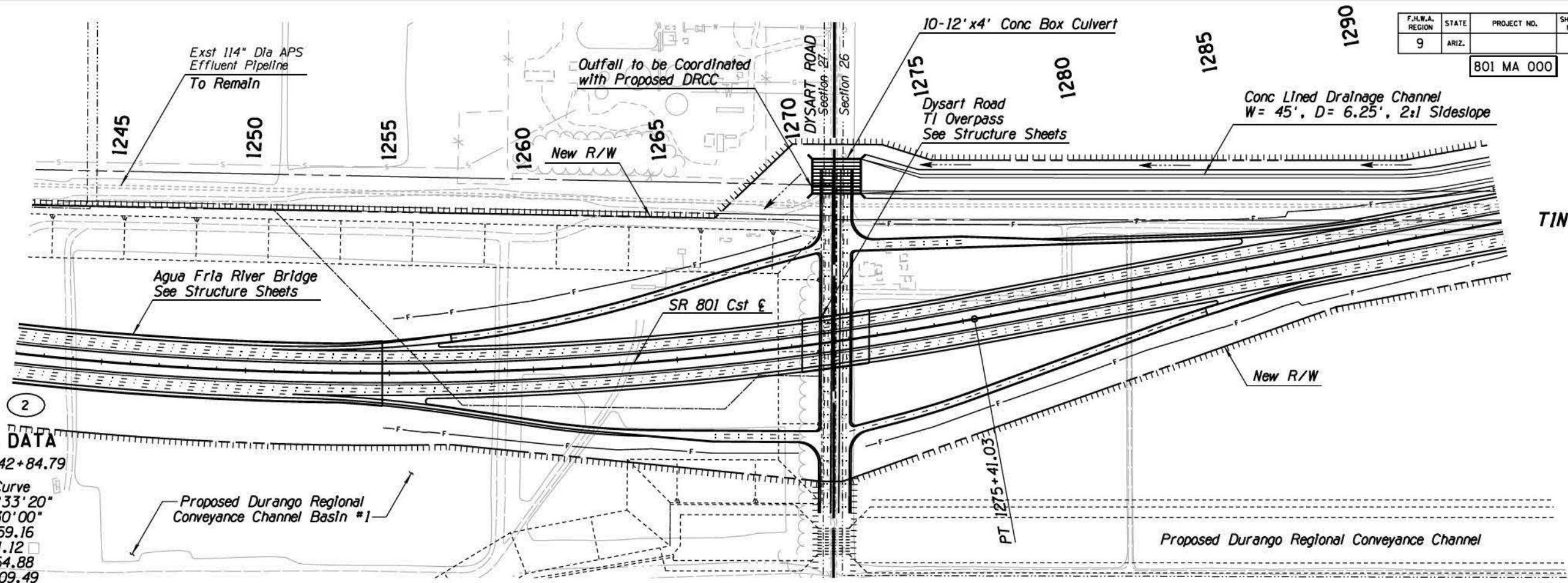


**CURVE DATA**  
 PI Sta 1242+84.79  
 Main Curve  
 $\Delta = 33^\circ 33' 20''$   
 $D = 0^\circ 30' 00''$   
 $R = 11459.16$   
 $L = 6711.12$   
 $T = 3454.88$   
 $Ext = 509.49$   
 Super = N/A

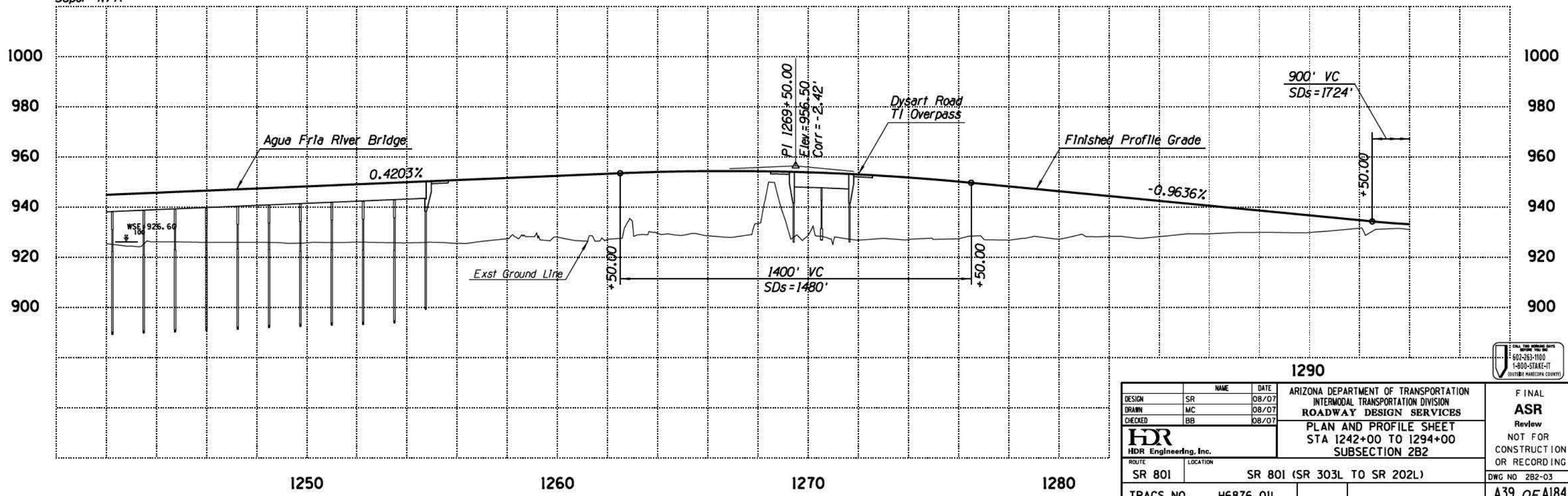


F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000

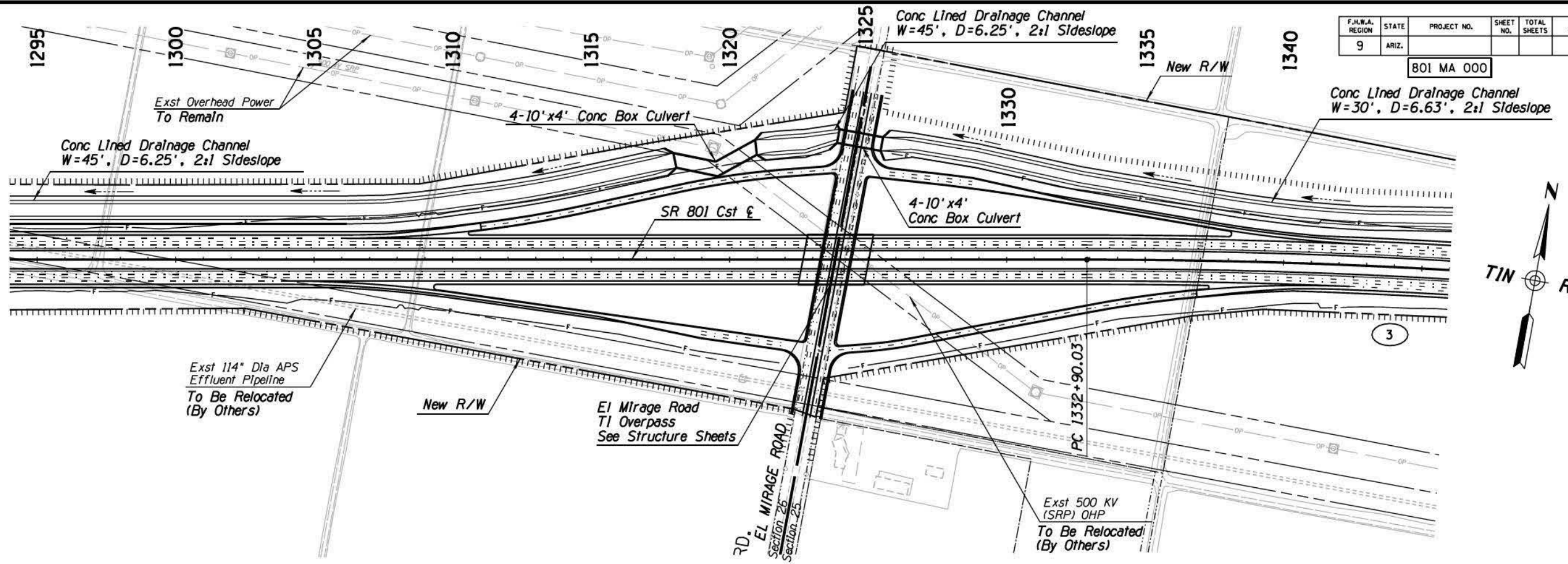


**2 CURVE DATA**  
 PI Sta 1242+84.79  
 Main Curve  
 $\Delta = 33^\circ 33' 20''$   
 $D = 0^\circ 30' 00''$   
 $R = 11459.16$   
 $L = 6711.12$   
 $T = 3454.88$   
 $Ext = 509.49$   
 Super = N/A



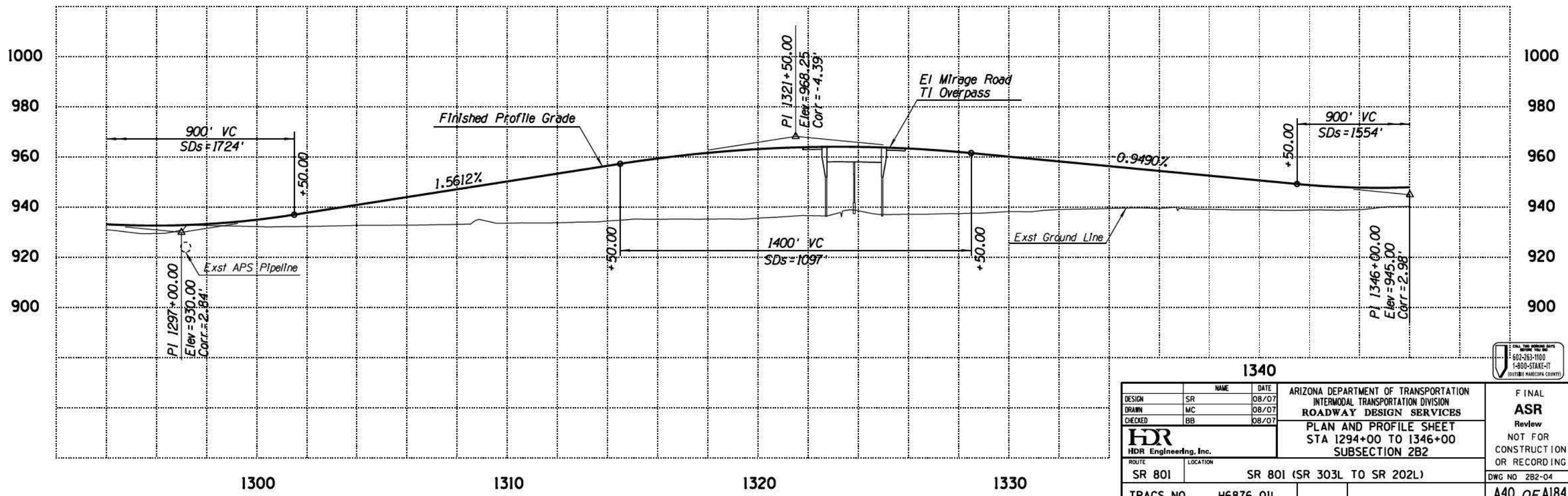
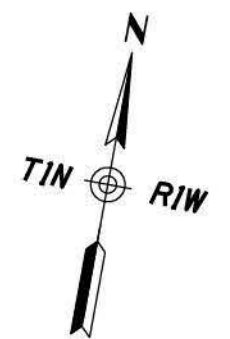
DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES PLAN AND PROFILE SHEET STA 1242+00 TO 1294+00 SUBSECTION 2B2	FINAL ASR Review NOT FOR CONSTRUCTION OR RECORDING DWG NO 282-03
DRAWN		MC	08/07		
CHECKED		BB	08/07		
ROUTE		SR 801		SR 801 (SR 303L TO SR 202L)	
LOCATION		SR 801		H6876 OIL	
TRACS NO.		H6876 OIL		A39 OF A184	

DATE: LOCATION: REVISIONS: FINISHED PLANS: SURVEY NO.



F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

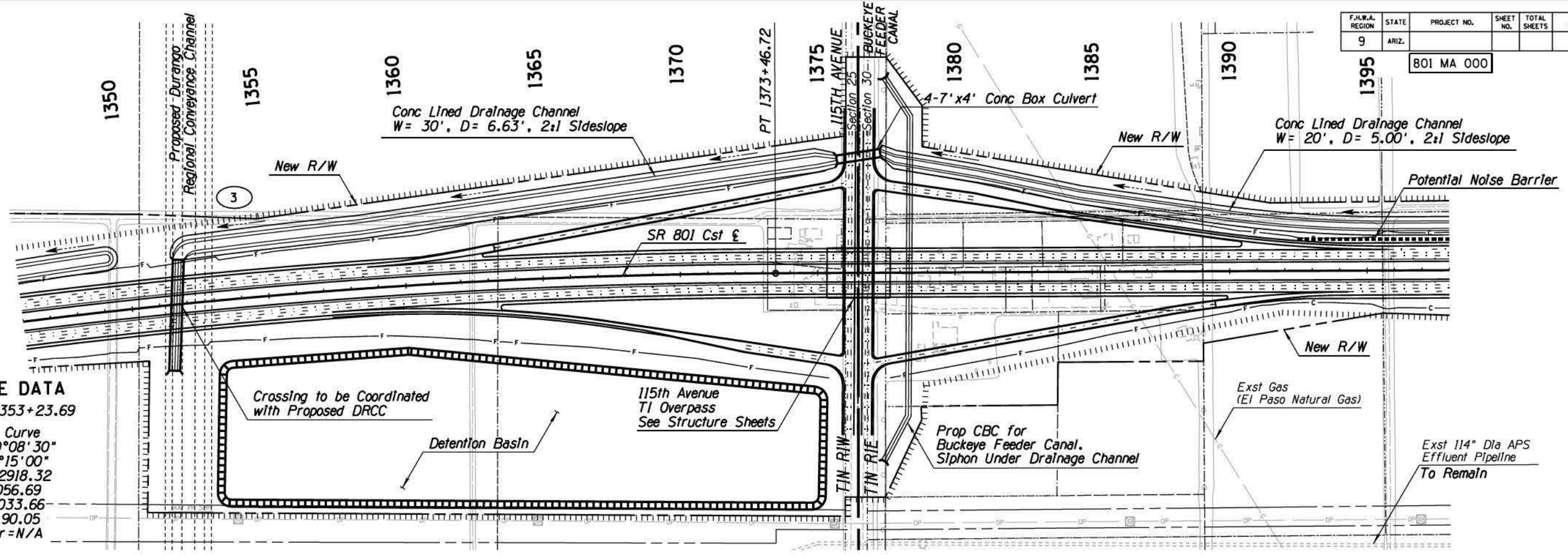
801 MA 000



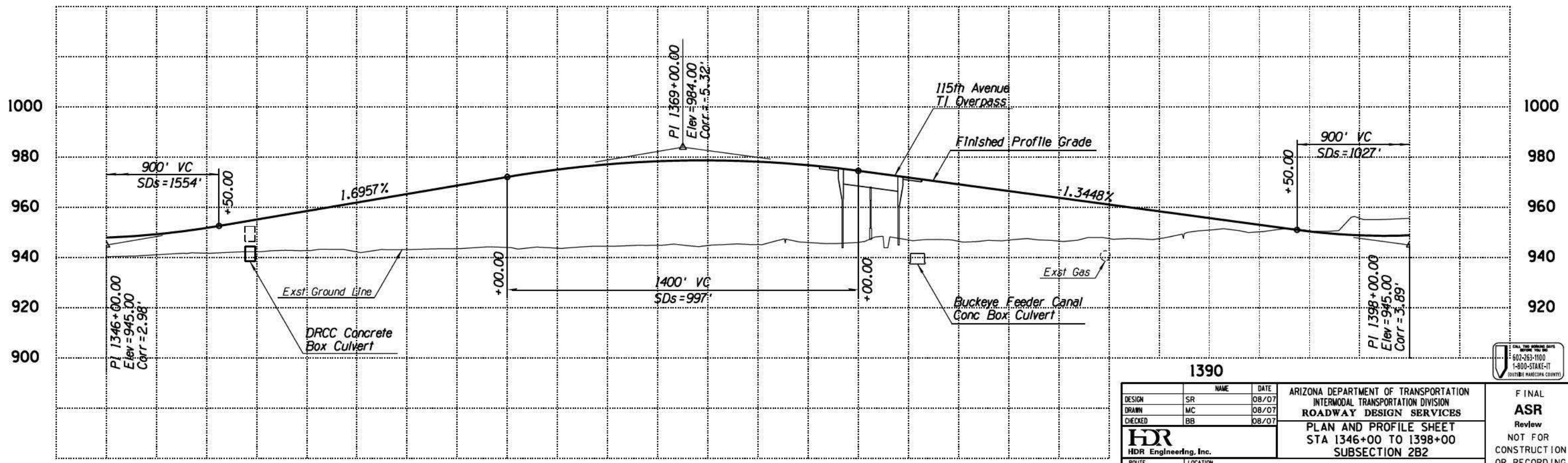
DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		MC	08/07		
CHECKED		BB	08/07		
ROUTE		SR 801 (SR 303L TO SR 202L)		PLAN AND PROFILE SHEET STA 1294+00 TO 1346+00 SUBSECTION 2B2	
LOCATION		SR 801 (SR 303L TO SR 202L)		DWG NO 282-04	
TRACS NO.		H6876 OIL		A40 OF A184	

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



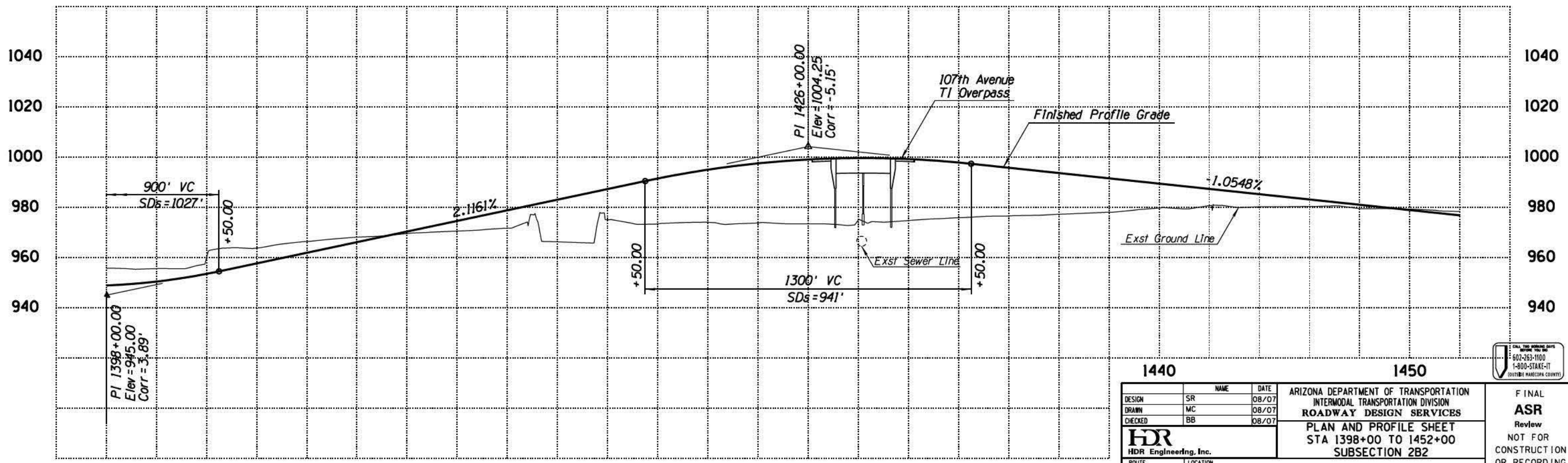
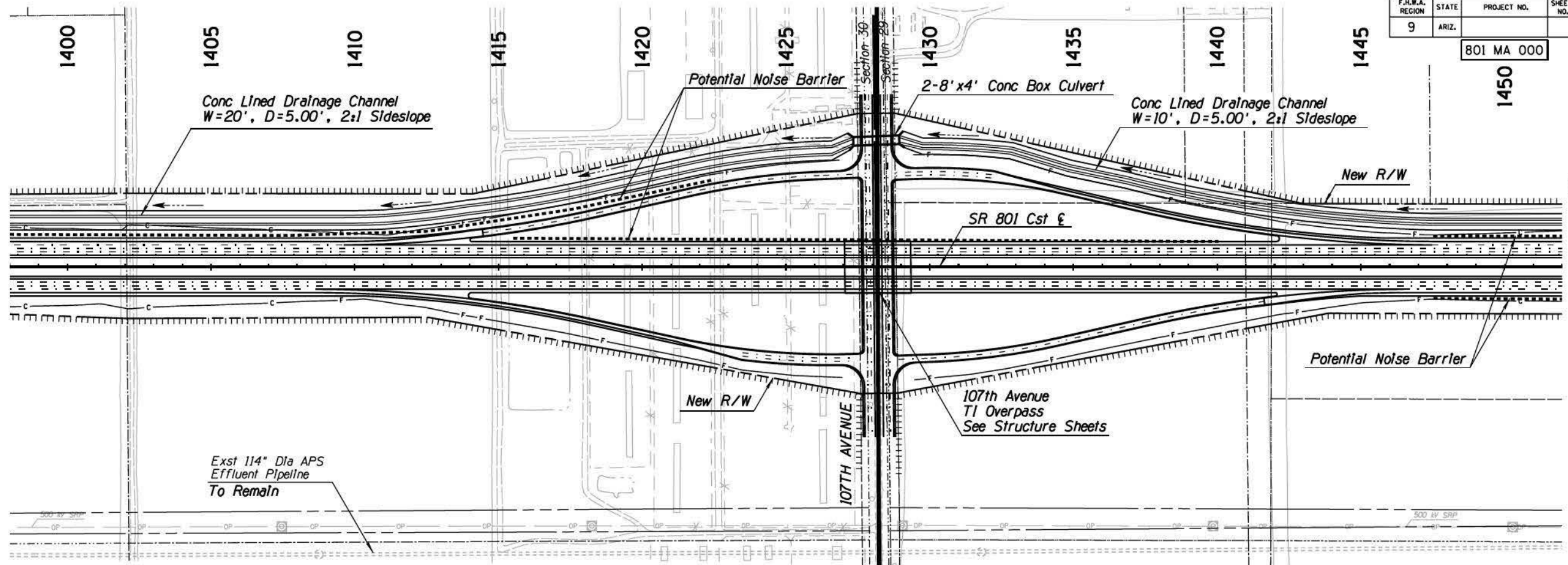
**3 CURVE DATA**  
 PI Sta 1353+23.69  
 Main Curve  
 $\Delta = 10^{\circ}08'30''$   
 $D = 0^{\circ}15'00''$   
 $R = 22918.32$   
 $L = 4056.69$   
 $T = 2033.66$   
 $Ext = 90.05$   
 $Super = N/A$



DESIGN		SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		MC	DATE	08/07		
CHECKED		BB	DATE	08/07		
ROUTE		SR 801		SR 801 (SR 303L TO SR 202L)		DWG NO 282-05
LOCATION		SR 801 (SR 303L TO SR 202L)		PLAN AND PROFILE SHEET STA 1346+00 TO 1398+00 SUBSECTION 2B2		A41 OF A184
TRACS NO.		H6876 OIL				

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000

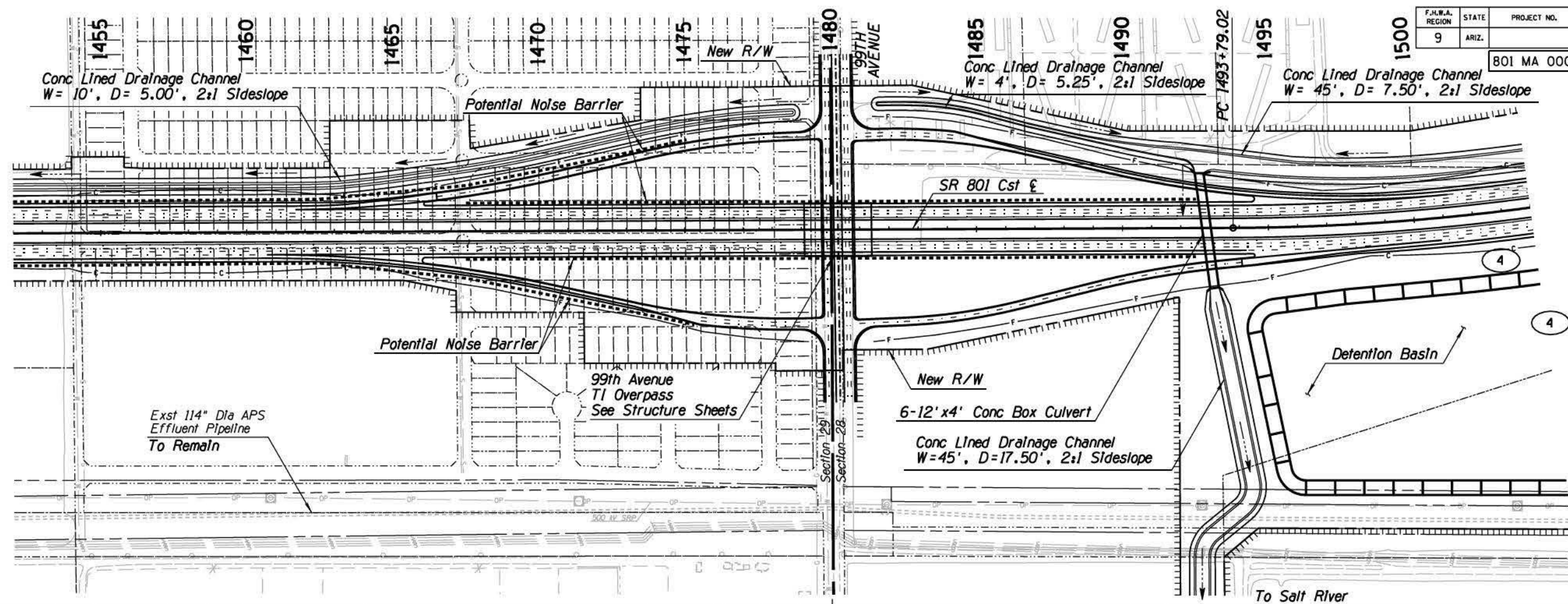


1440		1450	
DESIGN	SR	DATE	08/07
DRAWN	MC	DATE	08/07
CHECKED	BB	DATE	08/07
<b>HDR</b> HDR Engineering, Inc.			
ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES			
PLAN AND PROFILE SHEET STA 1398+00 TO 1452+00 SUBSECTION 2B2			
ROUTE	SR 801 (SR 303L TO SR 202L)		
TRACS NO.	H6876 OIL		
FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING			DWG NO 282-06 <b>A42 OF A184</b>

DATE: \_\_\_\_\_ LOCATION: \_\_\_\_\_ REVISIONS: \_\_\_\_\_ FINISHED PLANS: \_\_\_\_\_ SURVEY NO. \_\_\_\_\_

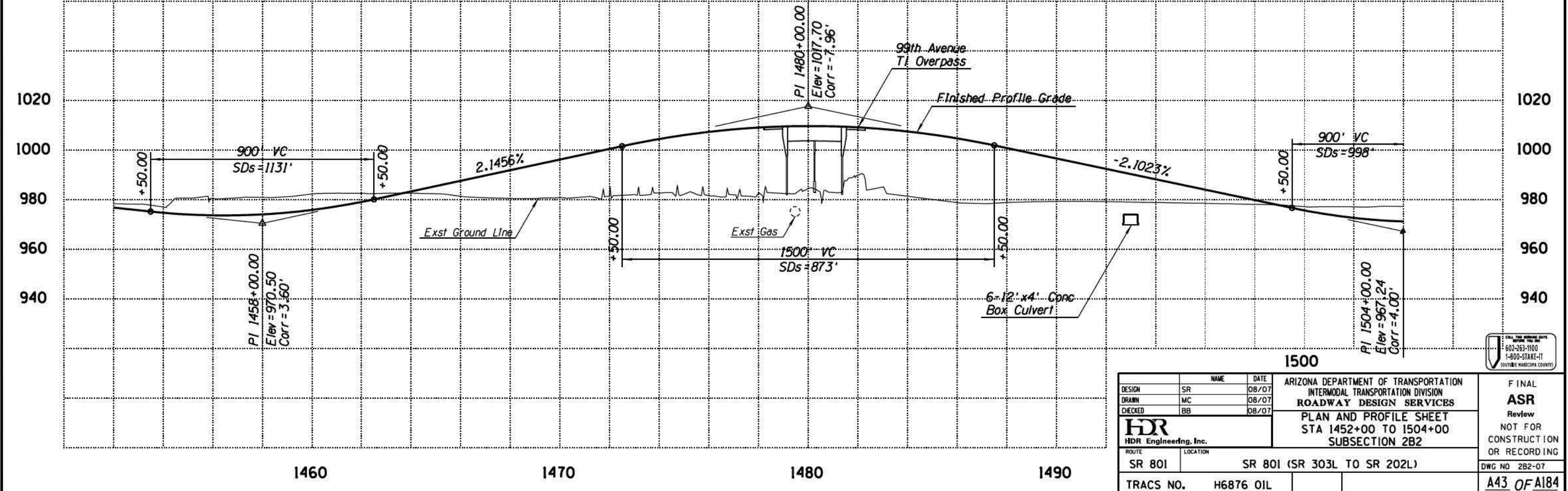
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

BOI MA 000



④ CURVE DATA  
PI Sta 1501+49.60

Main Curve  
 $\Delta = 11^{\circ}00'14''$   
 $D = 0^{\circ}42'58''$   
 $R = 8000.00$   
 $L = 1536.43$   
 $T = 770.59$   
 $Ext = 37.03$   
 $Super = N/A$

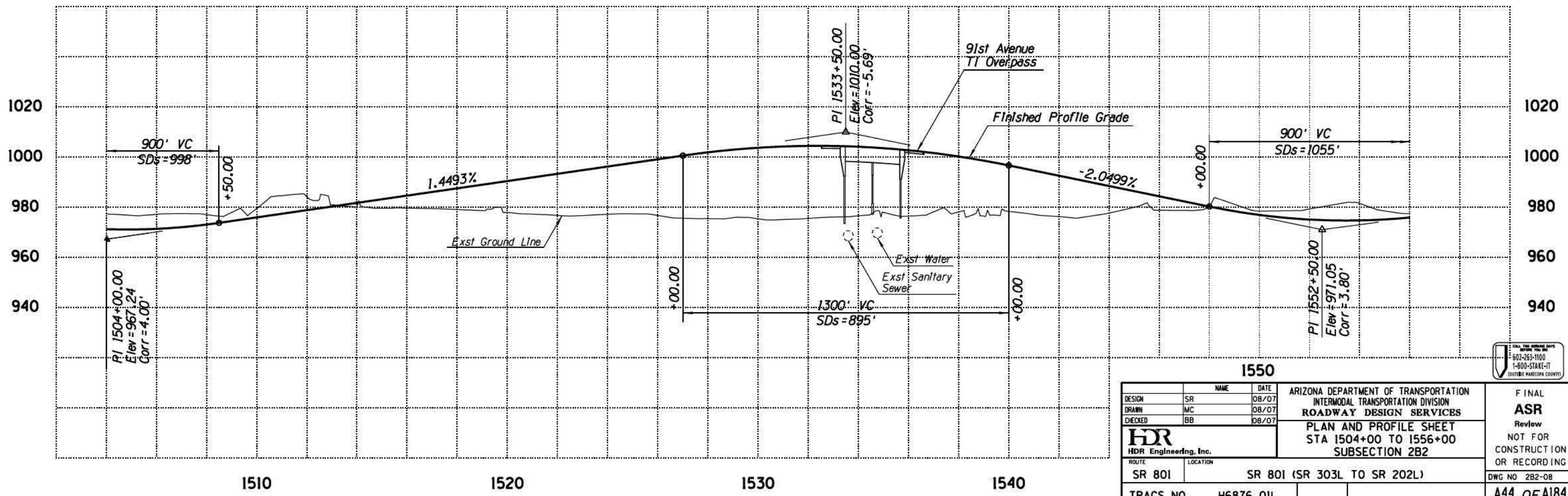
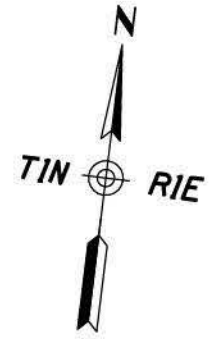
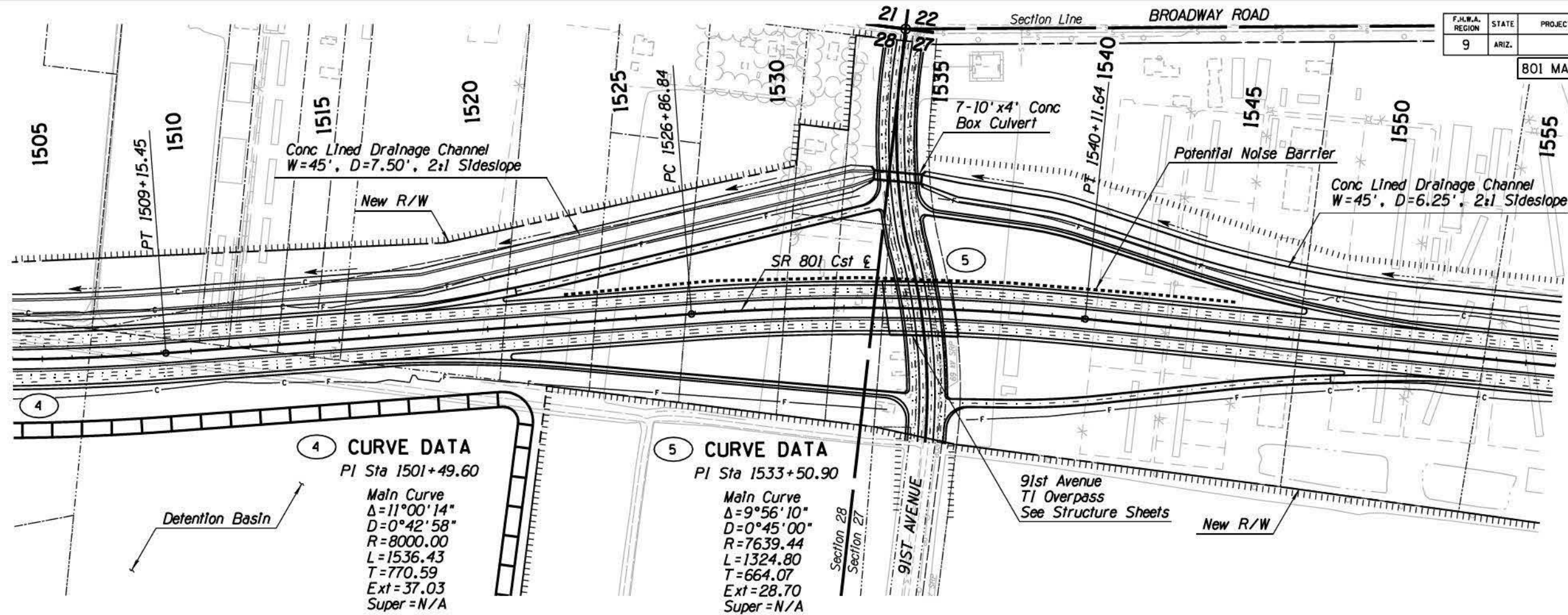


DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES PLAN AND PROFILE SHEET STA 1452+00 TO 1504+00 SUBSECTION 2B2	FINAL ASR Review NOT FOR CONSTRUCTION OR RECORDING DWG NO 282-07 A43 OF A184
DRAWN	MC	DATE	08/07		
CHECKED	BB	DATE	08/07		
ROUTE		SR 801		SR 801 (SR 303L TO SR 202L)	
LOCATION		SR 801		H6876 OIL	

DATE: LOCATION: REVISIONS: SURVEY NO. DATE: LOCATION: REVISIONS: SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000

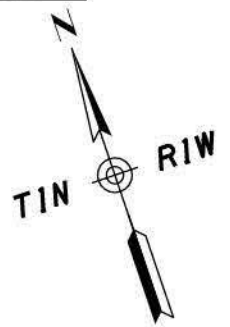
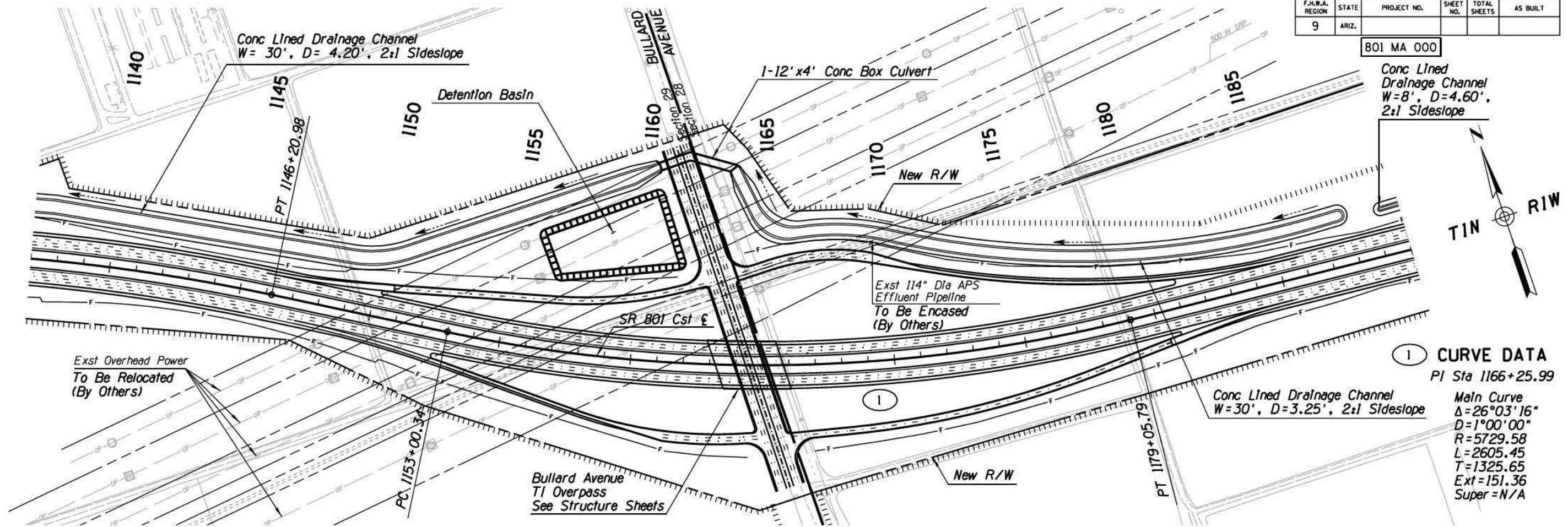


DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	MC	DATE	08/07		
CHECKED	BB	DATE	08/07		
				PLAN AND PROFILE SHEET STA 1504+00 TO 1556+00 SUBSECTION 2B2	DWG NO 282-08
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)	TRACS NO. H6876 OIL	
					A44 OF A184



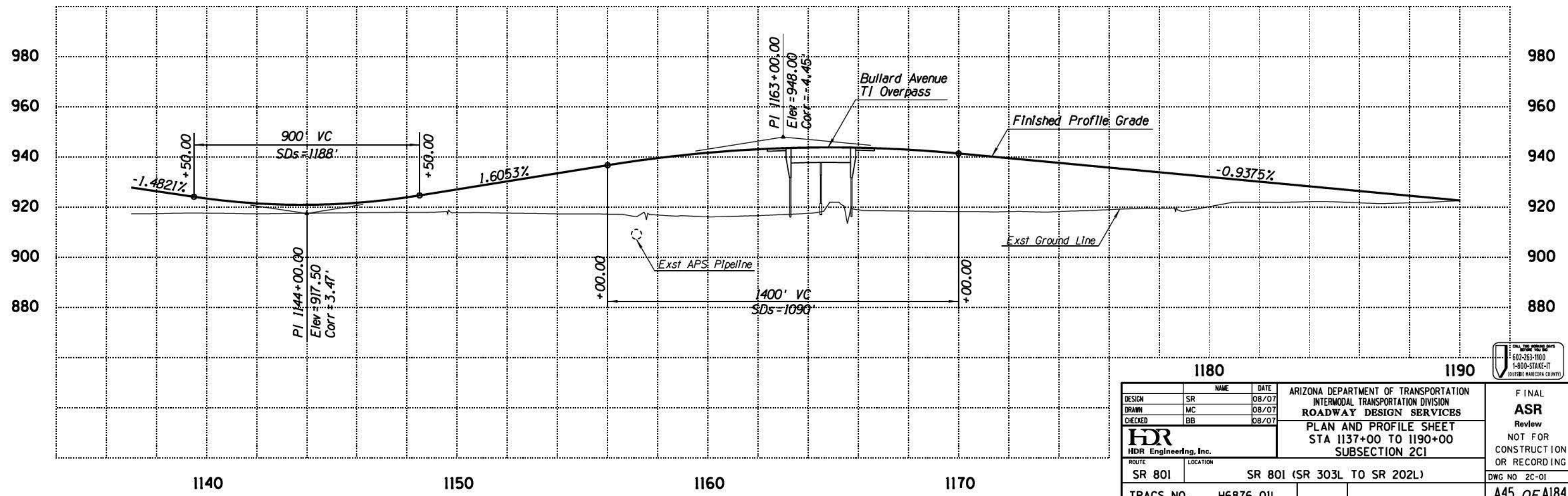
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



① CURVE DATA  
PI Sta 1166+25.99

Main Curve	$\Delta = 26^{\circ}03'16''$
	$D = 1^{\circ}00'00''$
	$R = 5729.58$
	$L = 2605.45$
	$T = 1325.65$
	$Ext = 151.36$
	$Super = N/A$

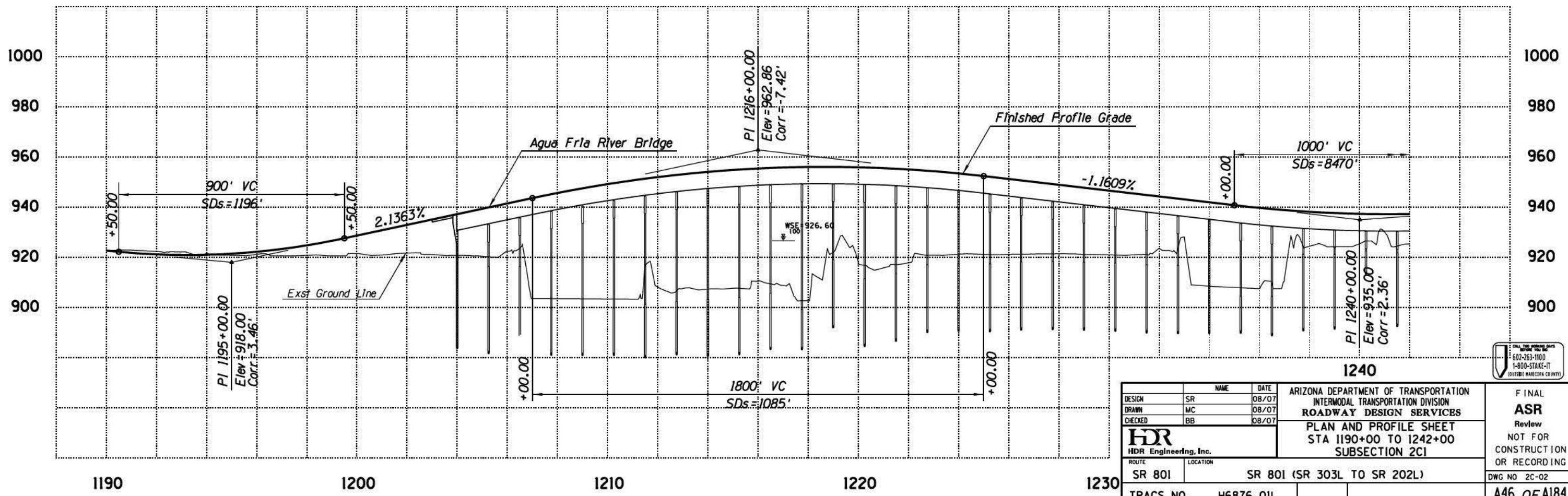
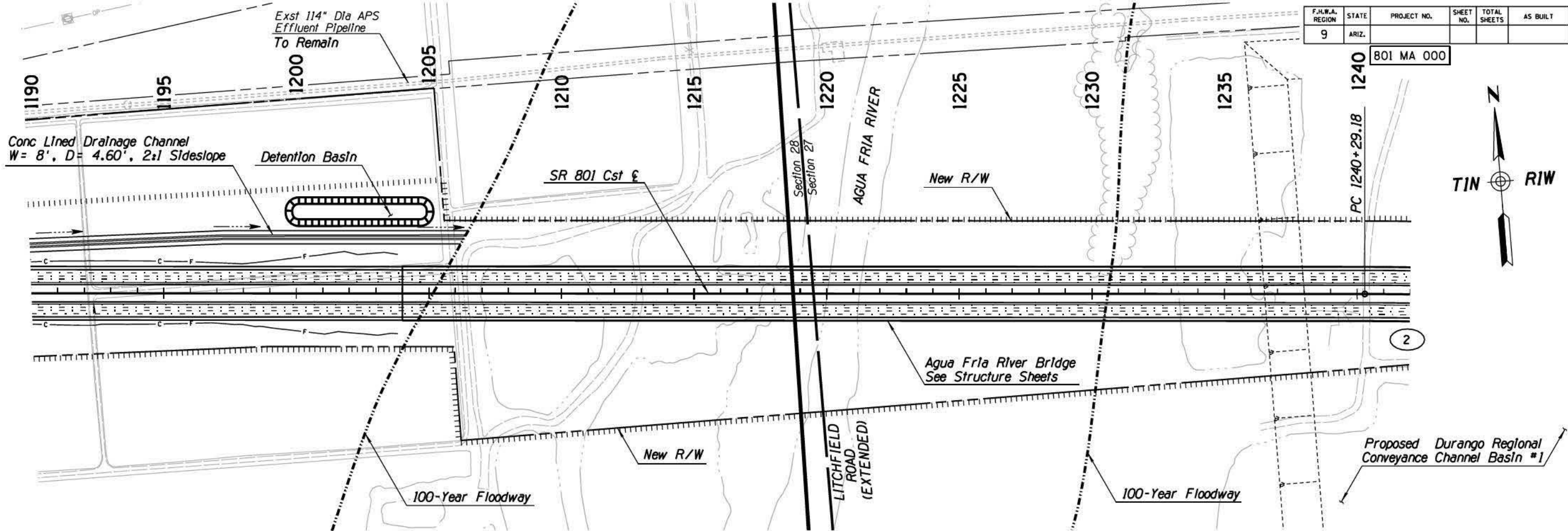


DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	MC	DATE	08/07		
CHECKED	BB	DATE	08/07		
<b>HDR</b> HDR Engineering, Inc.				PLAN AND PROFILE SHEET STA 1137+00 TO 1190+00 SUBSECTION 2C1	DWG NO 2C-01
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)	A45 OF A184	
TRACS NO.	H6876 OIL				

DATE: LOCATION: FINISHED PLANS: SURVEY NO. REVISIONS: FINISHED PLANS: SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

BOI MA 000



DESIGN	NAME	DATE
SR		08/07
DRAWN	MC	08/07
CHECKED	BB	08/07

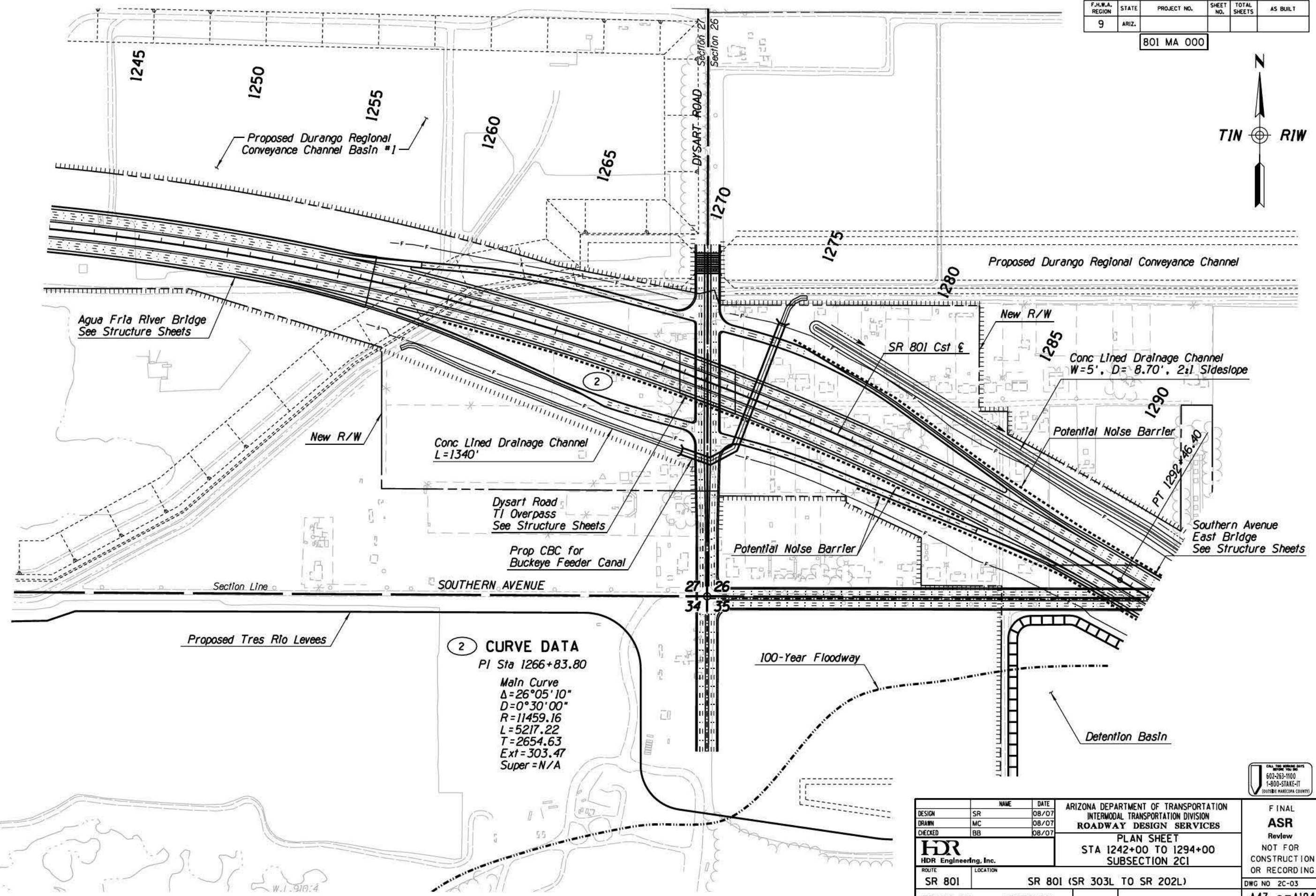
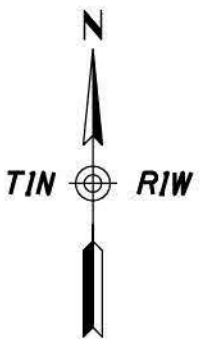
ARIZONA DEPARTMENT OF TRANSPORTATION  
 INTERMODAL TRANSPORTATION DIVISION  
 ROADWAY DESIGN SERVICES  
 PLAN AND PROFILE SHEET  
 STA 1190+00 TO 1242+00  
 SUBSECTION 2C1

FINAL  
**ASR**  
 Review  
 NOT FOR  
 CONSTRUCTION  
 OR RECORDING  
 DWG NO 2C-02  
**A46 OF A184**

ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)
TRACS NO.	H6876 OIL		

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



**2 CURVE DATA**  
 PI Sta 1266+83.80  
 Main Curve  
 $\Delta = 26^{\circ}05'10''$   
 $D = 0^{\circ}30'00''$   
 $R = 11459.16$   
 $L = 5217.22$   
 $T = 2654.63$   
 $Ext = 303.47$   
 Super = N/A

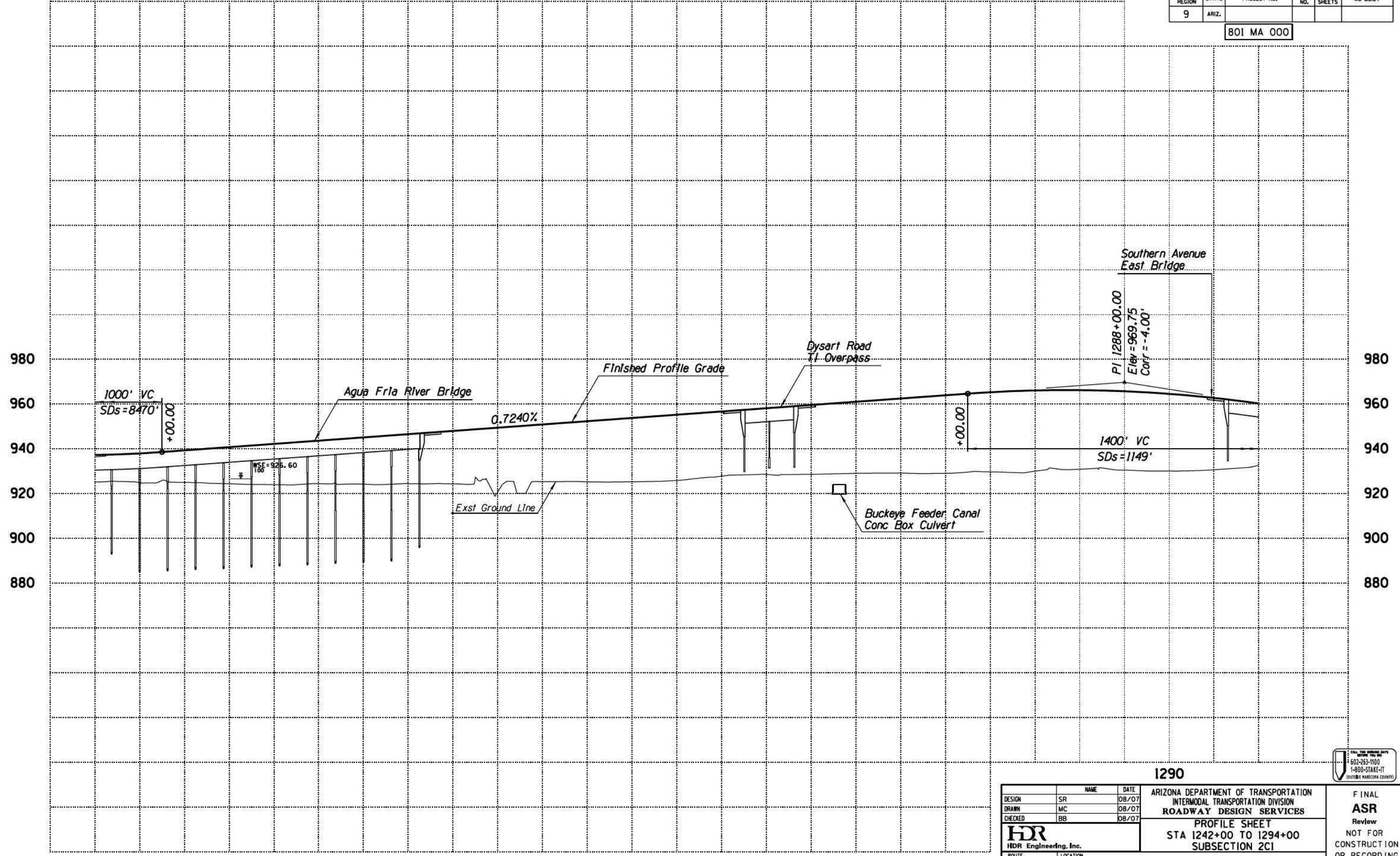
DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	MC	DATE	08/07		
CHECKED	BB	DATE	08/07		
<b>HDR</b> HDR Engineering, Inc.				PLAN SHEET STA 1242+00 TO 1294+00 SUBSECTION 2C1	
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)		
TRACS NO.	H6876 OIL				DWG NO 2C-03 <b>A47 OF A184</b>



DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



1290

DESIGN	NAME	DATE
SR		08/07
DRAWN	MC	08/07
CHECKED	BB	08/07

ARIZONA DEPARTMENT OF TRANSPORTATION  
INTERMODAL TRANSPORTATION DIVISION  
ROADWAY DESIGN SERVICES



PROFILE SHEET  
STA 1242+00 TO 1294+00  
SUBSECTION 2C1

FINAL  
ASR  
Review  
NOT FOR  
CONSTRUCTION  
OR RECORDING

ROUTE	LOCATION
SR 801	SR 801 (SR 303L TO SR 202L)

DWG NO 2C-04

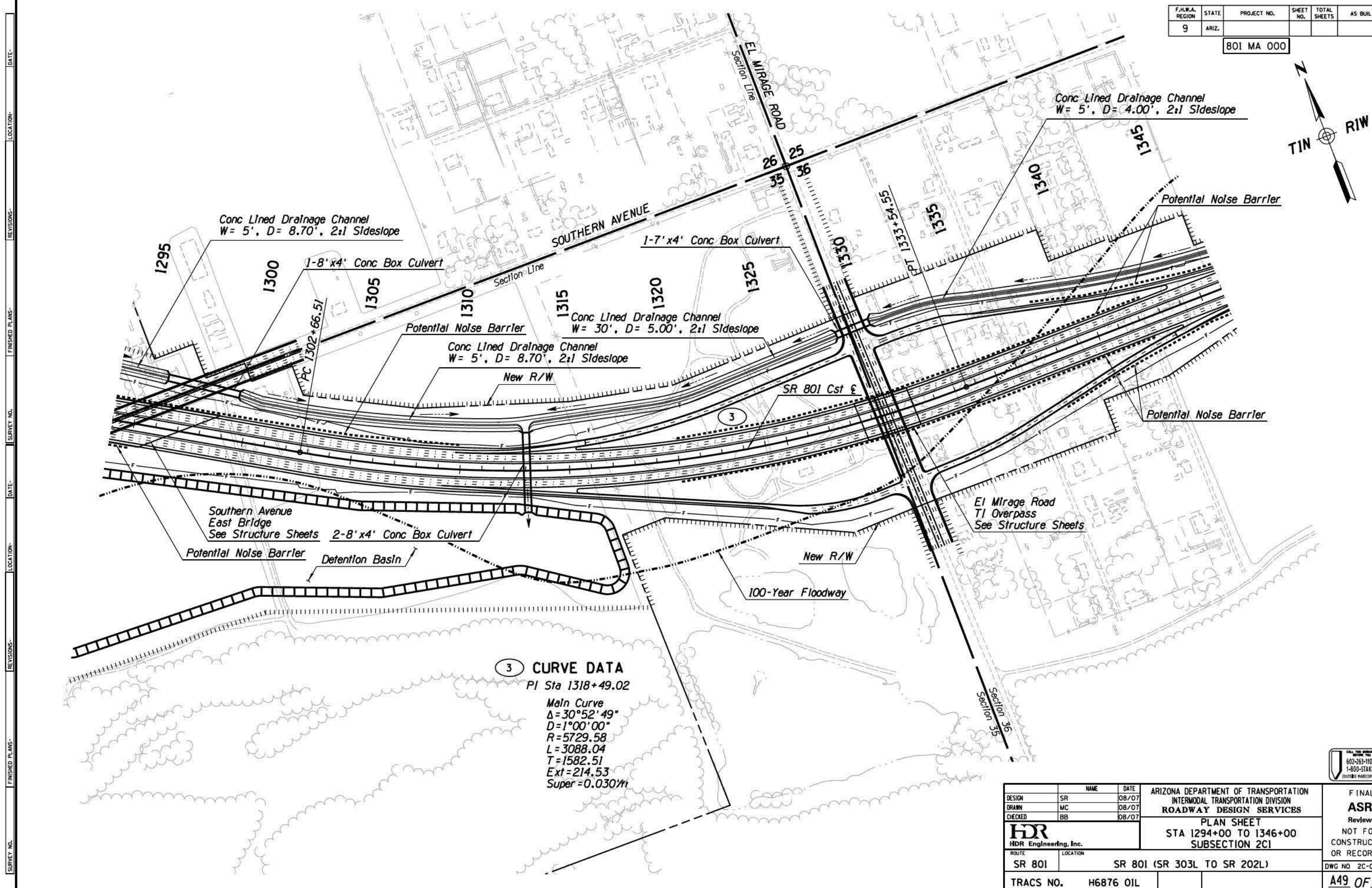
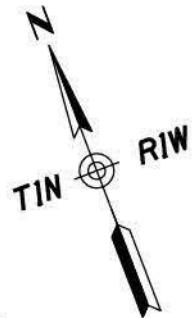
TRACS NO. H6876 OIL

A48 OF A184

DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



**3 CURVE DATA**  
 PI Sta 1318+49.02  
 Main Curve  
 $\Delta = 30^{\circ}52'49''$   
 $D = 1^{\circ}00'00''$   
 $R = 5729.58$   
 $L = 3088.04$   
 $T = 1582.51$   
 $Ext = 214.53$   
 $Super = 0.030/m$

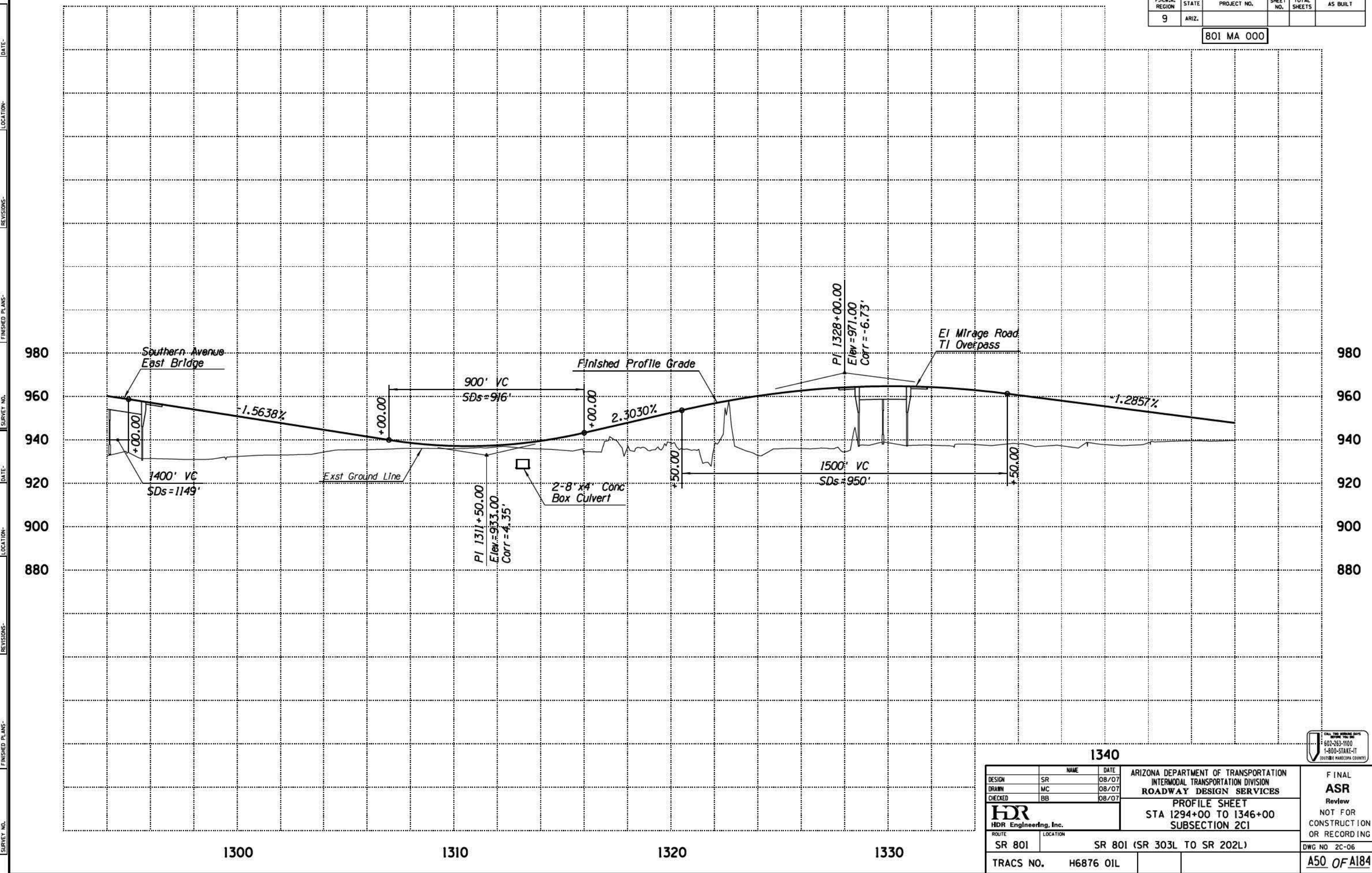
SURVEY NO. FINISHED PLANS- REVISIONS- LOCATION- DATE- FINISHED PLANS- SURVEY NO. DATE- FINISHED PLANS- REVISIONS- LOCATION- DATE-



DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	MC	DATE	08/07		
CHECKED	BB	DATE	08/07		
<b>HDR</b> HDR Engineering, Inc.				PLAN SHEET STA 1294+00 TO 1346+00 SUBSECTION 2C1	
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)	DWG NO 2C-05	
TRACS NO.	H6876 OIL				<b>A49 OF A184</b>

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



SURVEY NO. FINISHED PLANS DATE REVISIONS LOCATION DATE FINISHED PLANS SURVEY NO. DATE REVISIONS LOCATION DATE

1340

DESIGN	SR	DATE	08/07
DRAWN	MC	DATE	08/07
CHECKED	BB	DATE	08/07

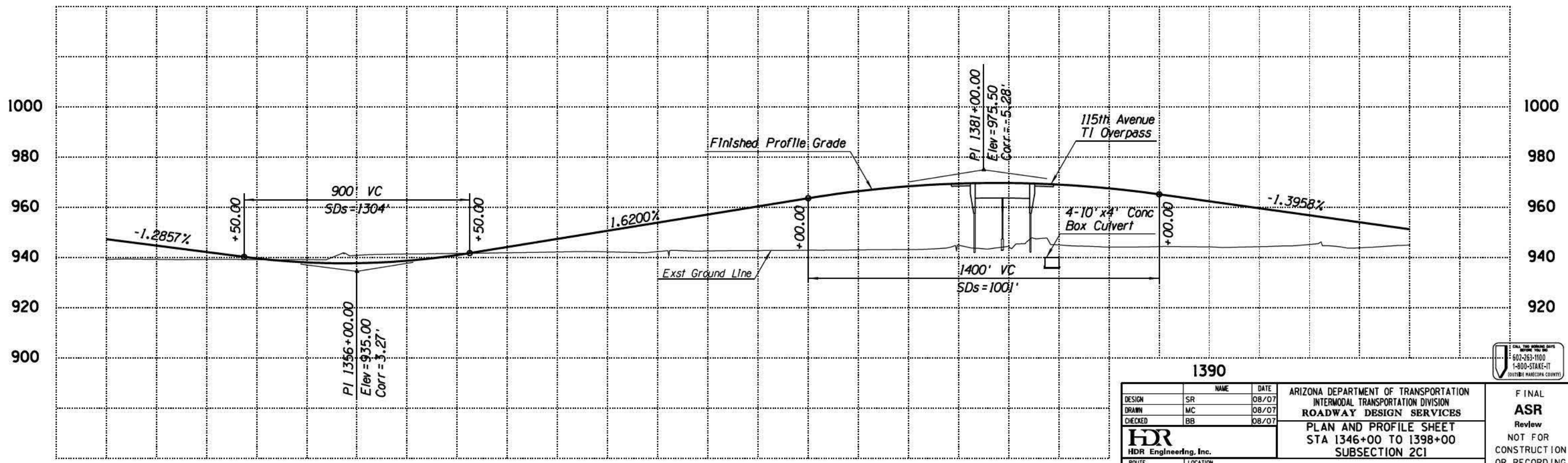
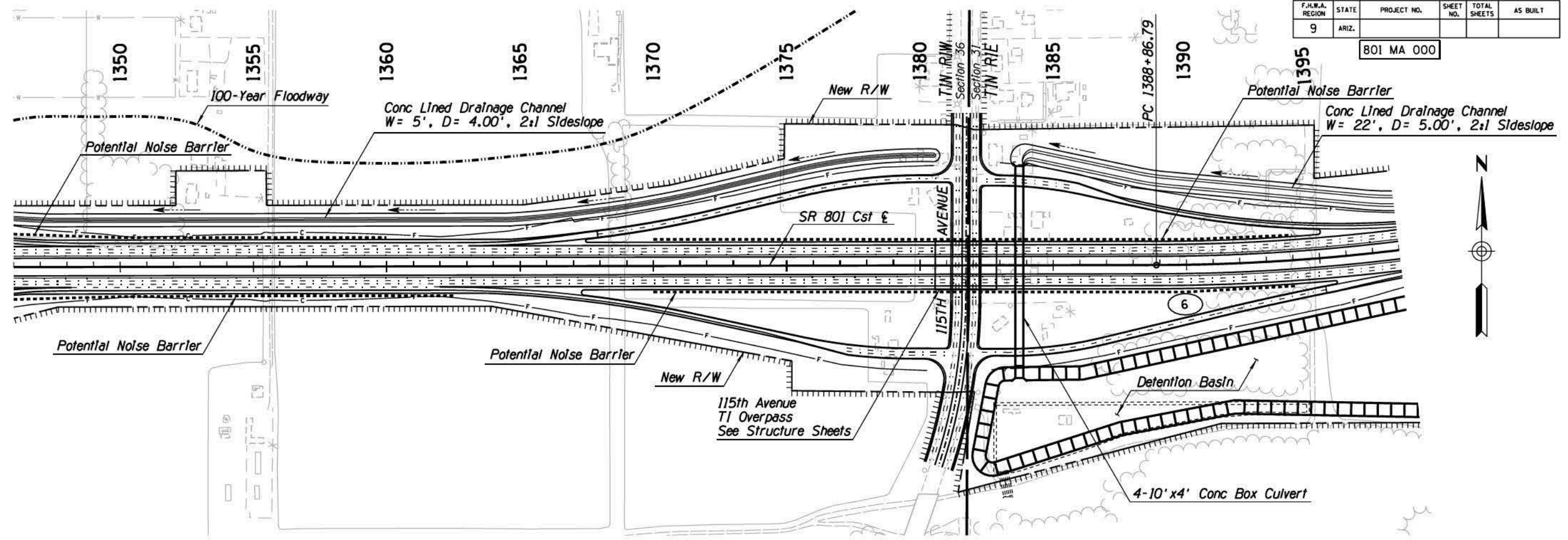
ARIZONA DEPARTMENT OF TRANSPORTATION  
 INTERMODAL TRANSPORTATION DIVISION  
 ROADWAY DESIGN SERVICES  
 PROFILE SHEET  
 STA 1294+00 TO 1346+00  
 SUBSECTION 2C1

FINAL  
 ASR  
 Review  
 NOT FOR  
 CONSTRUCTION  
 OR RECORDING  
 DWG NO 2C-06  
 A50 OF A184

ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)
TRACS NO.	H6876 OIL		

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		MC	08/07		
CHECKED		BB	08/07		
ROUTE		SR 801		PLAN AND PROFILE SHEET STA 1346+00 TO 1398+00 SUBSECTION 2C1	DWG NO 2C-07
LOCATION		SR 801 (SR 303L TO SR 202L)			
TRACS NO.		H6876 OIL		A51 OF A184	

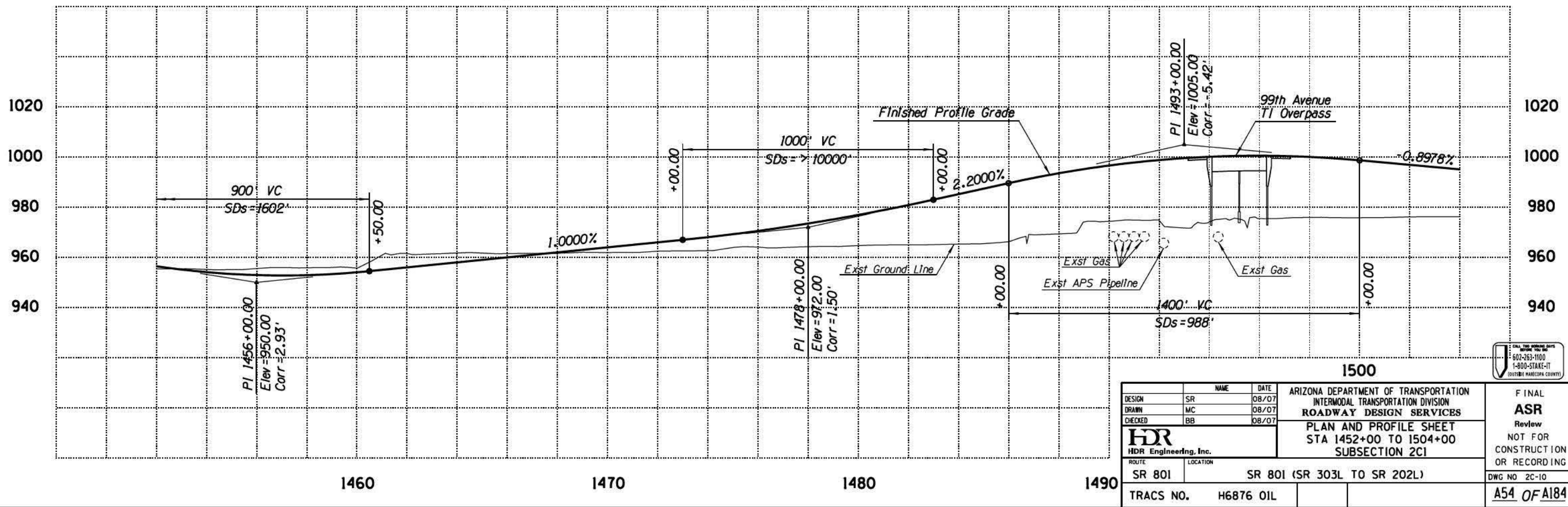
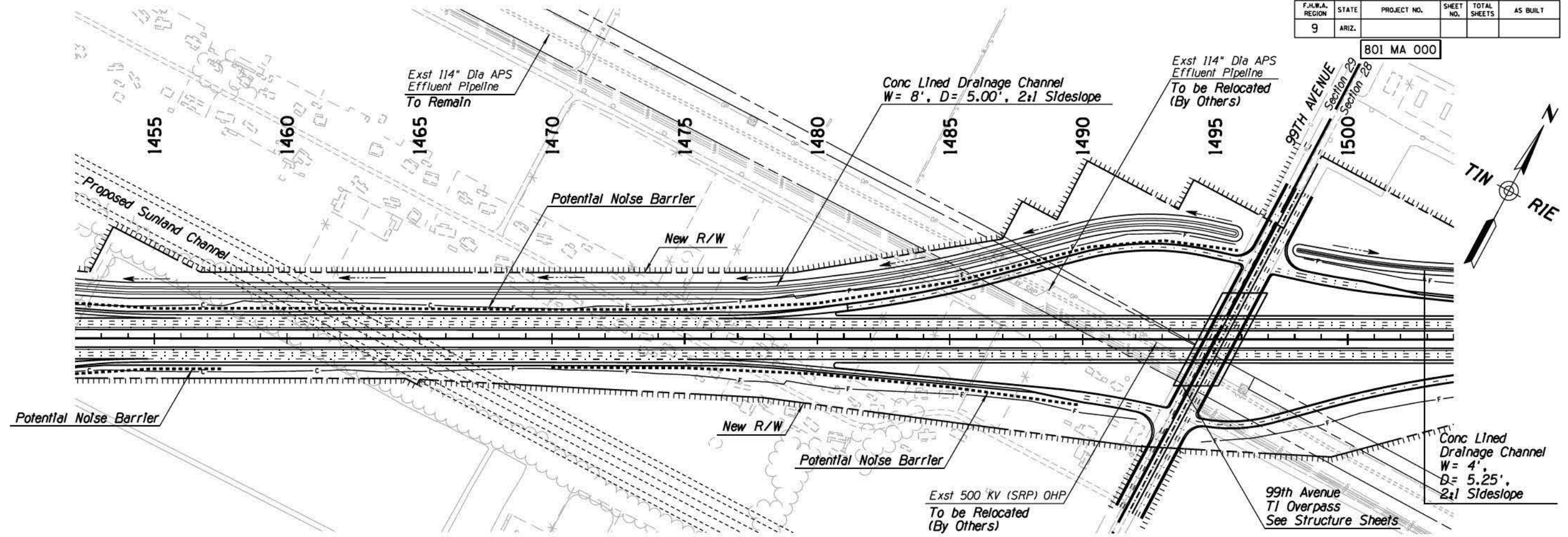






F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



DESIGN	NAME	DATE
SR		08/07
DRAWN	MC	08/07
CHECKED	BB	08/07

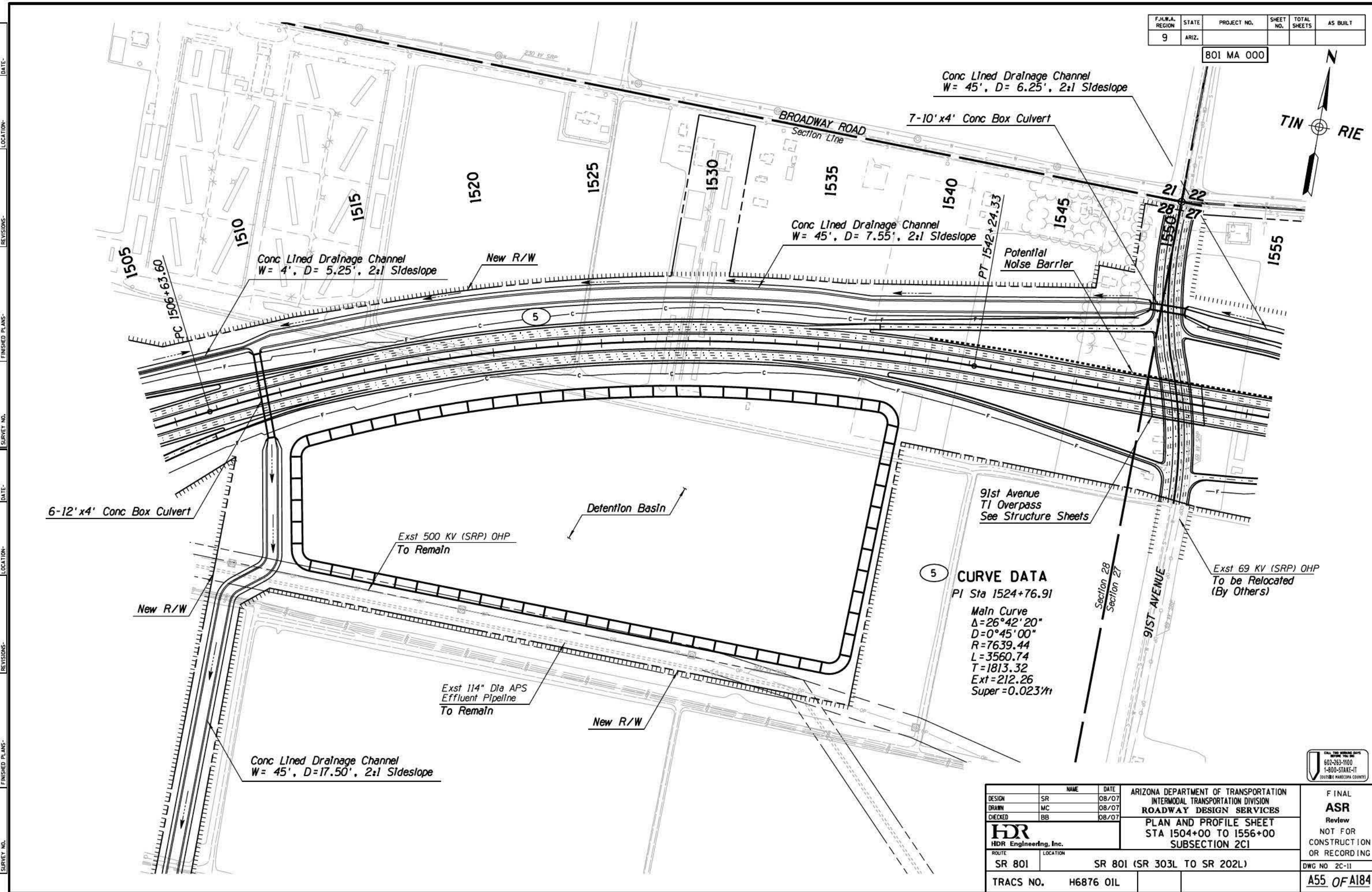
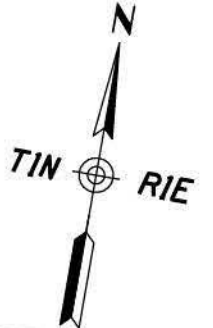
ARIZONA DEPARTMENT OF TRANSPORTATION  
 INTERMODAL TRANSPORTATION DIVISION  
 ROADWAY DESIGN SERVICES  
 PLAN AND PROFILE SHEET  
 STA 1452+00 TO 1504+00  
 SUBSECTION 2C1

FINAL  
**ASR**  
 Review  
 NOT FOR  
 CONSTRUCTION  
 OR RECORDING  
 DWG NO 2C-10  
**A54 OF A184**

ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)
TRACS NO.	H6876 OIL		

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



Conc Lined Drainage Channel  
W= 45', D= 6.25', 2:1 Sideslope

7-10' x4' Conc Box Culvert

Conc Lined Drainage Channel  
W= 4', D= 5.25', 2:1 Sideslope

Conc Lined Drainage Channel  
W= 45', D= 7.55', 2:1 Sideslope

Potential Noise Barrier

6-12' x4' Conc Box Culvert

Exst 500 KV (SRP) OHP  
To Remain

Detention Basin

91st Avenue  
TI Overpass  
See Structure Sheets

Exst 69 KV (SRP) OHP  
To be Relocated  
(By Others)

5 CURVE DATA  
PI Sta 1524+76.91  
Main Curve  
Δ=26°42'20"  
D=0°45'00"  
R=7639.44  
L=3560.74  
T=1813.32  
Ext=212.26  
Super=0.0231/ft

Exst 114" Dia APS  
Effluent Pipeline  
To Remain

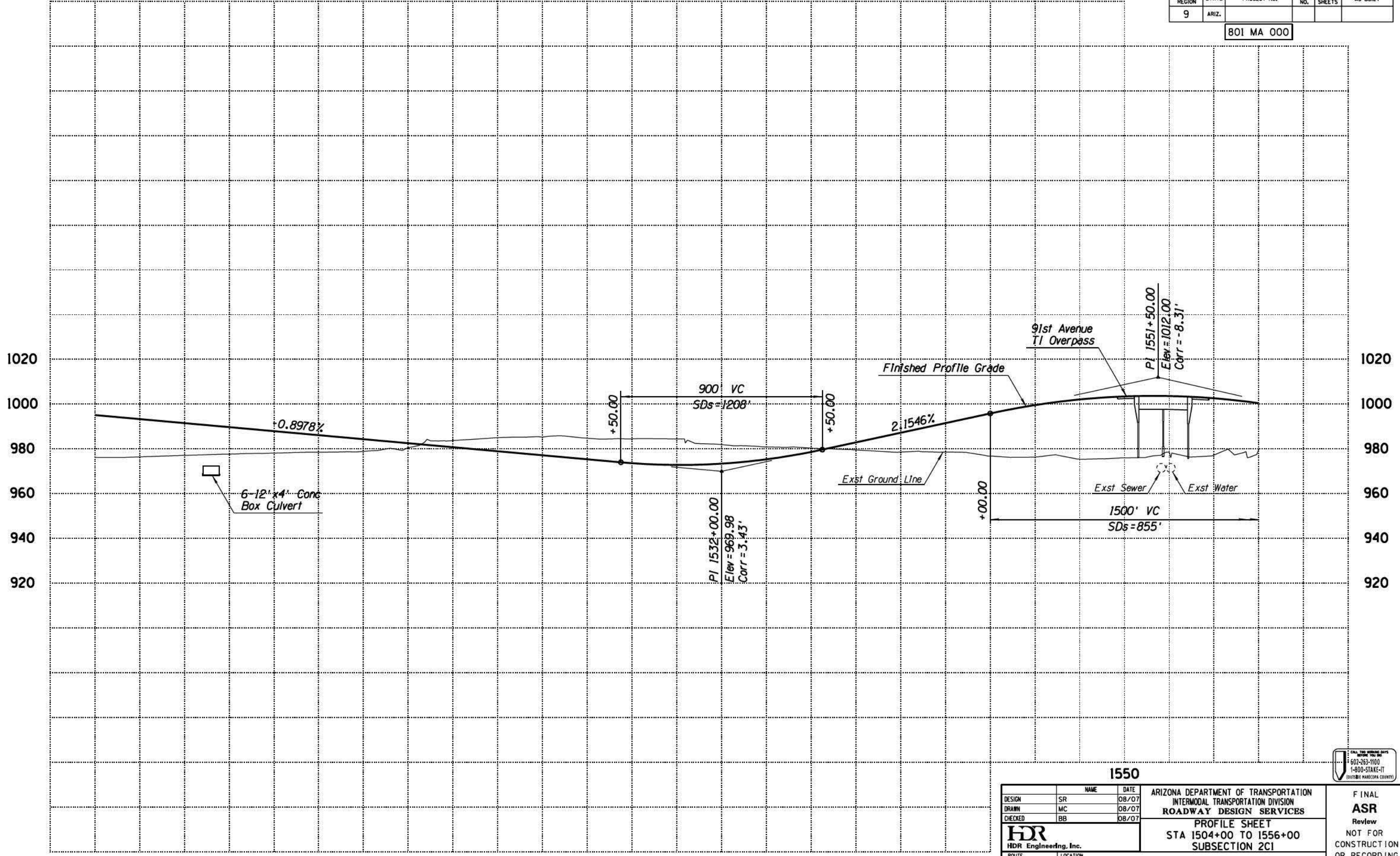
Conc Lined Drainage Channel  
W= 45', D=17.50', 2:1 Sideslope



DESIGN	SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	MC	08/07		
CHECKED	BB	08/07		
			PLAN AND PROFILE SHEET STA 1504+00 TO 1556+00 SUBSECTION 2C1	DWG NO 2C-11
ROUTE	SR 801	SR 801 (SR 303L TO SR 202L)		
TRACS NO.	H6876 OIL			A55 OF A184

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



SURVEY NO. FINISHED PLANS- REVISIONS- LOCATION- DATE- SURVEY NO. FINISHED PLANS- REVISIONS- LOCATION- DATE-

1510

1520

1530

1540

1550

DESIGN	SR	08/07
DRAWN	MC	08/07
CHECKED	BB	08/07

ARIZONA DEPARTMENT OF TRANSPORTATION  
INTERMODAL TRANSPORTATION DIVISION  
ROADWAY DESIGN SERVICES



PROFILE SHEET  
STA 1504+00 TO 1556+00  
SUBSECTION 2C1

ROUTE SR 801 LOCATION SR 801 (SR 303L TO SR 202L)

TRACS NO. H6876 OIL



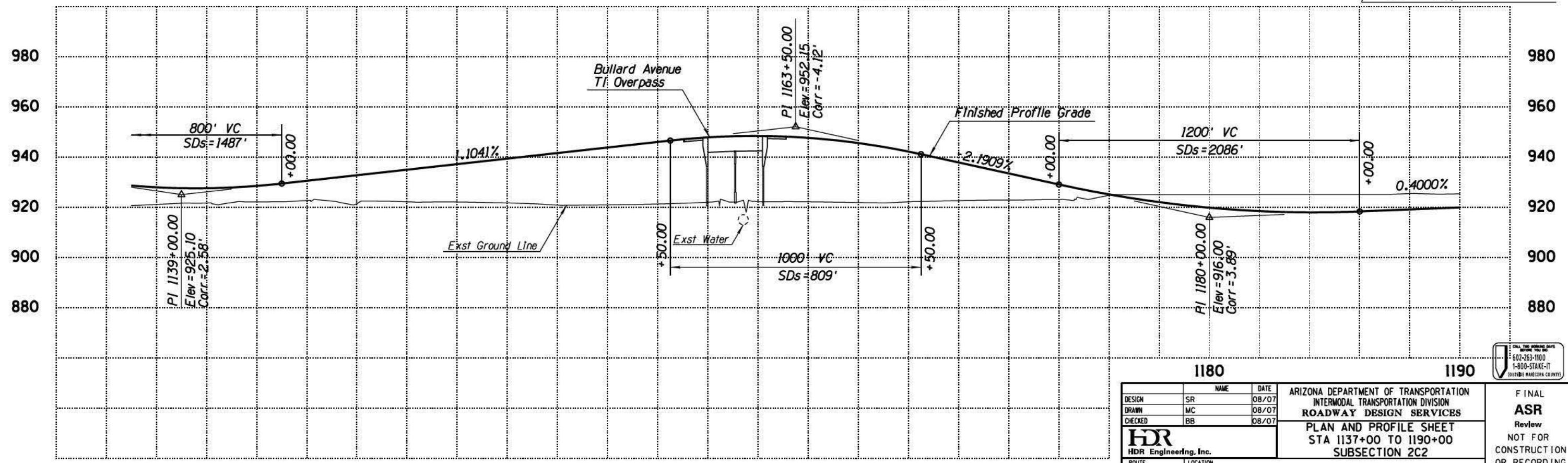
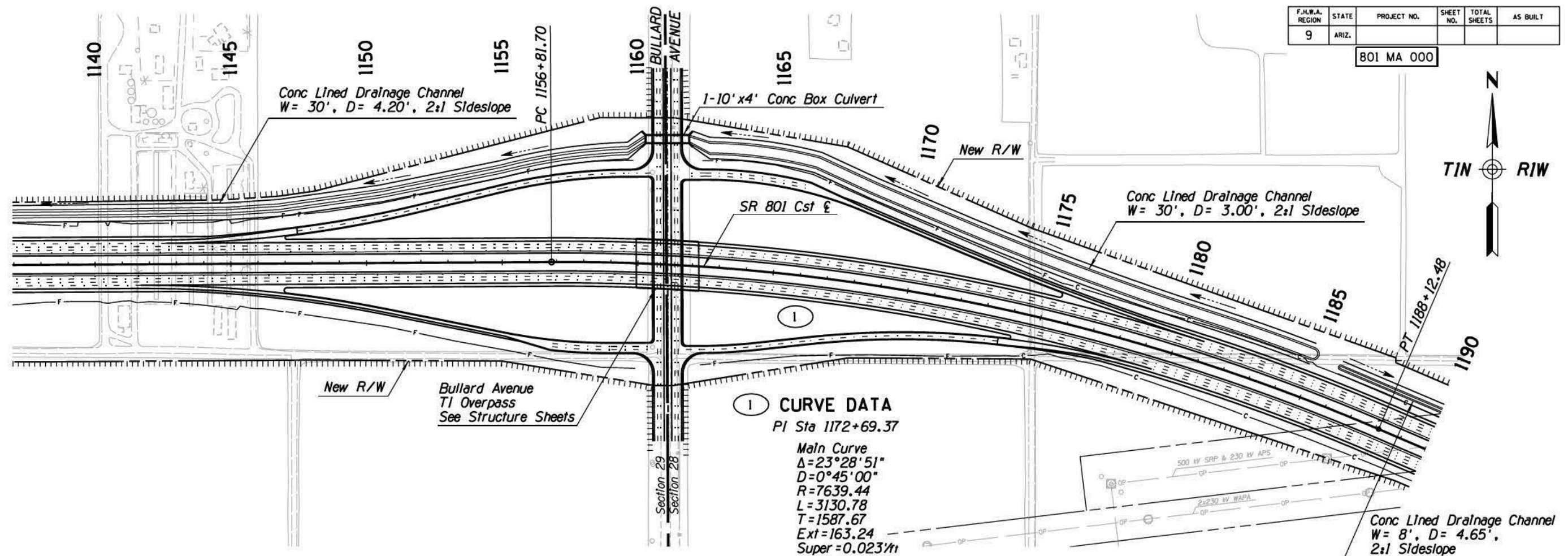
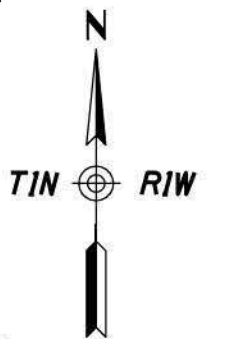
FINAL  
ASR  
Review  
NOT FOR  
CONSTRUCTION  
OR RECORDING

DWG NO 2C-12

A56 OF A184

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

BOI MA 000



DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	MC	DATE	08/07		
CHECKED	BB	DATE	08/07		
<b>HDR</b> HDR Engineering, Inc.				PLAN AND PROFILE SHEET STA 1137+00 TO 1190+00 SUBSECTION 2C2	DWG NO 2C2-01
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)	TRACS NO. H6876 OIL	
					<b>A57 OF A184</b>

**2 CURVE DATA**

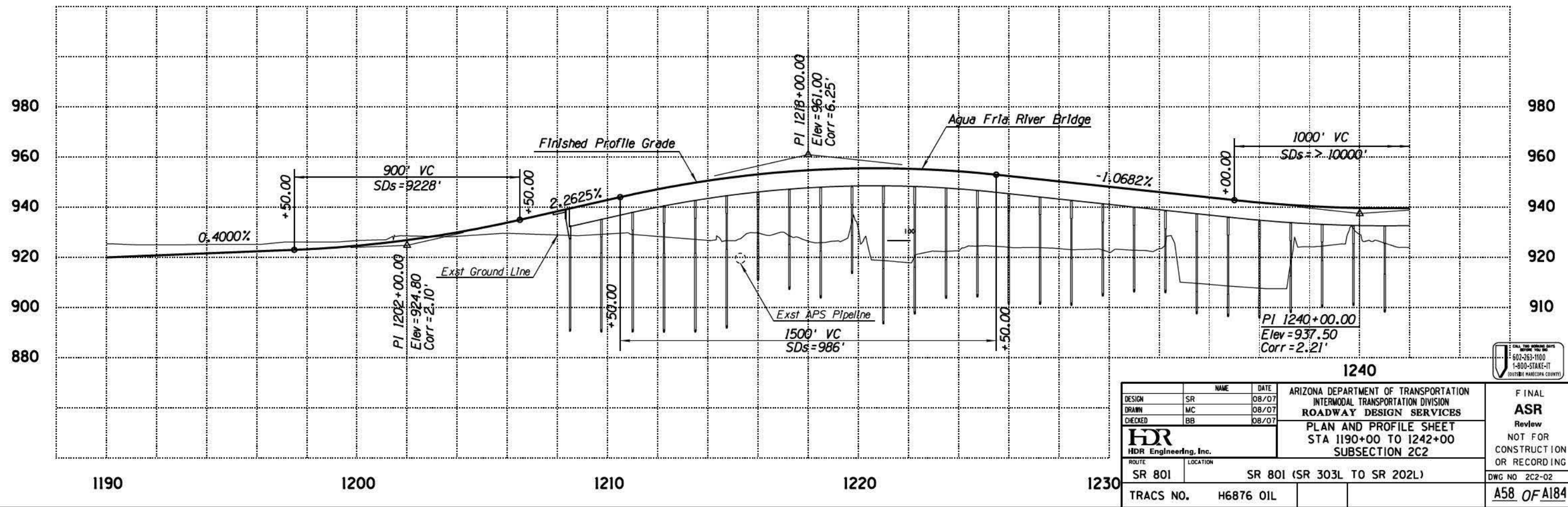
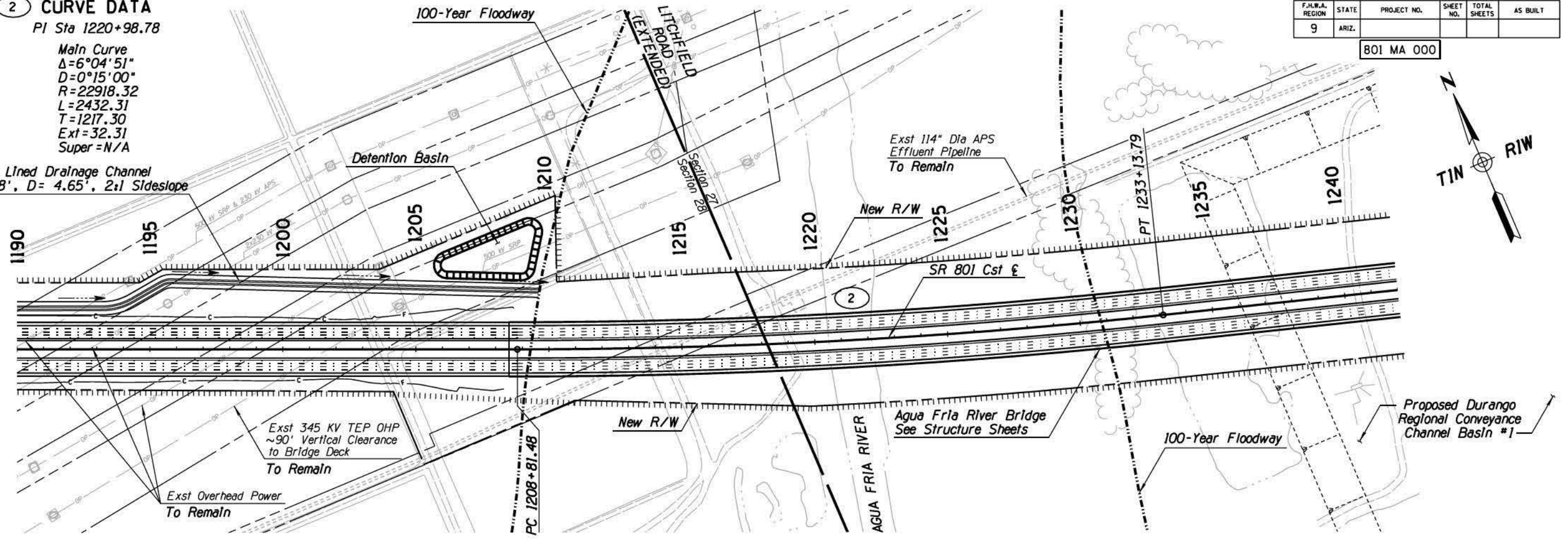
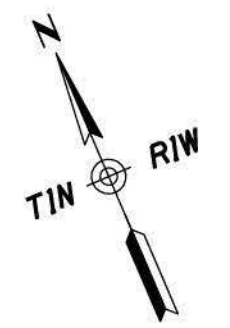
PI Sta 1220+98.78

Main Curve  
 $\Delta = 6^{\circ}04'51''$   
 $D = 0^{\circ}15'00''$   
 $R = 22918.32$   
 $L = 2432.31$   
 $T = 1217.30$   
 $Ext = 32.31$   
 $Super = N/A$

Conc Lined Drainage Channel  
 $W = 8'$ ,  $D = 4.65'$ ,  $2:1$  Sideslope

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000

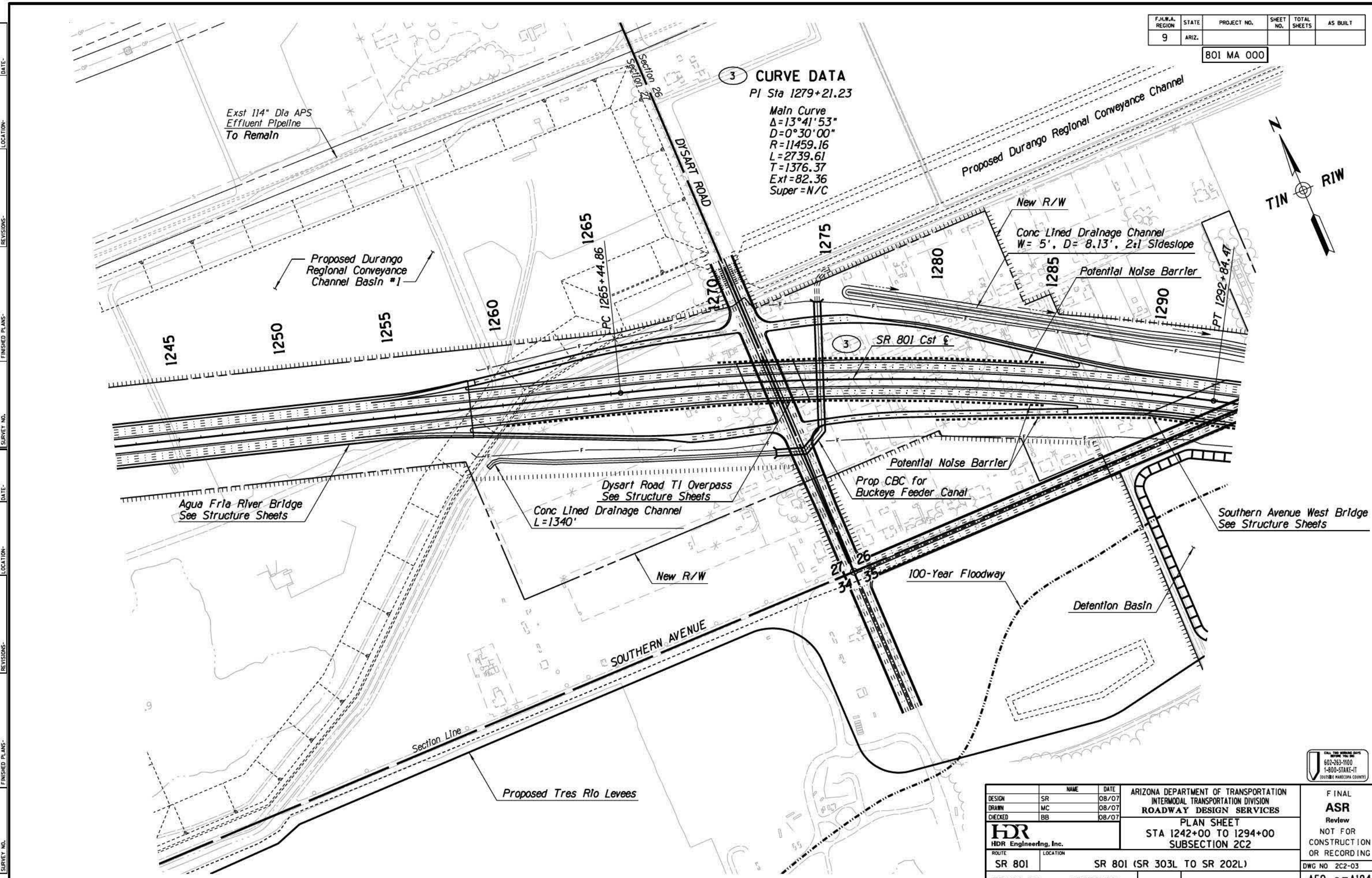
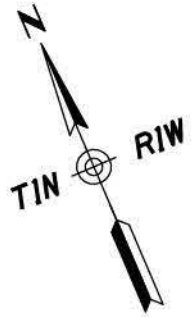


DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	MC	DATE	08/07		
CHECKED	BB	DATE	08/07		
<b>HDR</b> HDR Engineering, Inc.				PLAN AND PROFILE SHEET STA 1190+00 TO 1242+00 SUBSECTION 2C2	DWG NO 2C2-02
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)	A58 OF A184	
TRACS NO.	H6876 OIL				

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000

**3 CURVE DATA**  
 PI Sta 1279+21.23  
 Main Curve  
 $\Delta = 13^\circ 41' 53''$   
 $D = 0^\circ 30' 00''$   
 $R = 11459.16$   
 $L = 2739.61$   
 $T = 1376.37$   
 $Ext = 82.36$   
 $Super = N/C$



DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

	NAME	DATE
DESIGN	SR	08/07
DRAWN	MC	08/07
CHECKED	BB	08/07

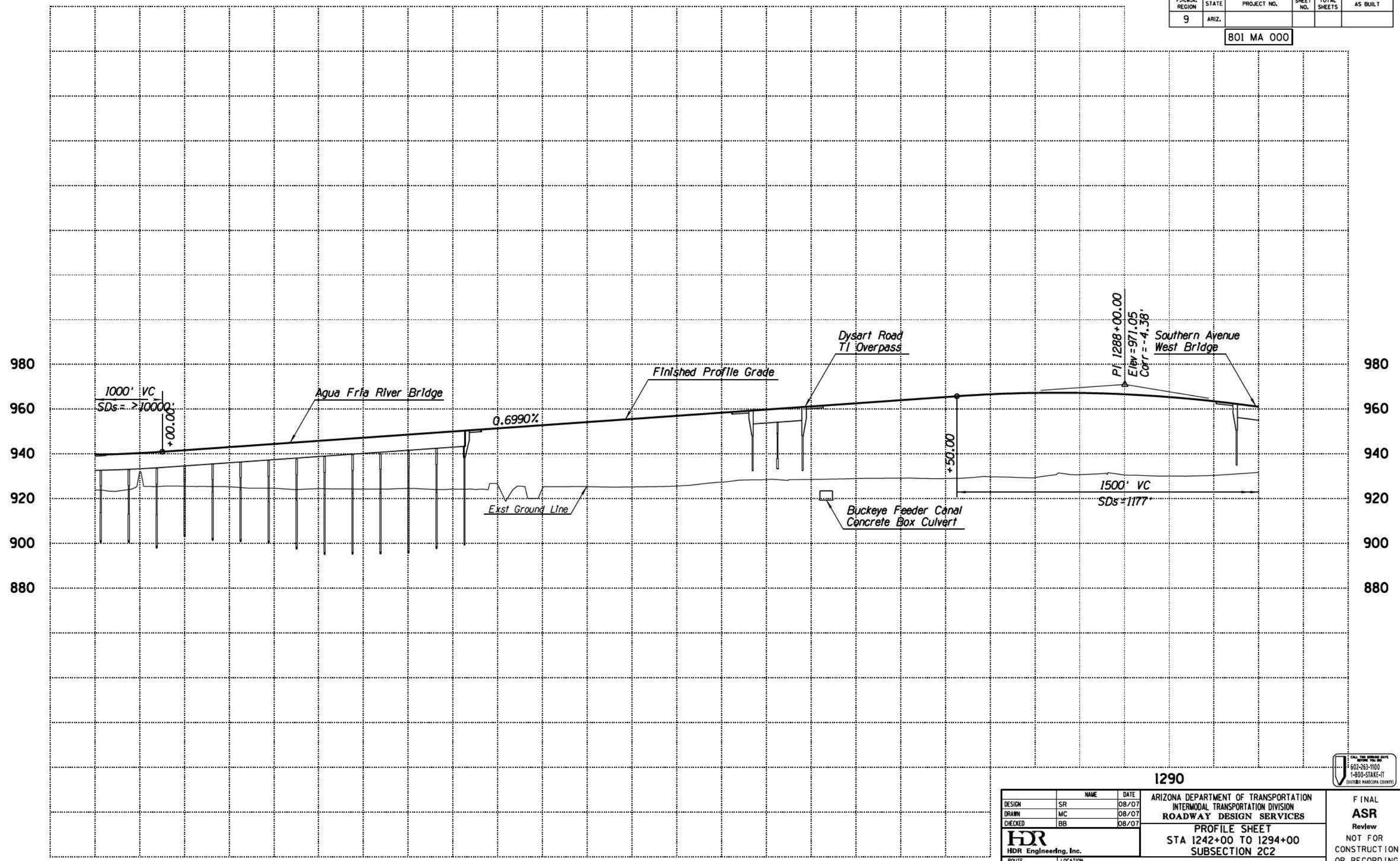
ARIZONA DEPARTMENT OF TRANSPORTATION  
 INTERMODAL TRANSPORTATION DIVISION  
**ROADWAY DESIGN SERVICES**  
 PLAN SHEET  
 STA 1242+00 TO 1294+00  
 SUBSECTION 2C2

FINAL  
**ASR**  
 Review  
 NOT FOR  
 CONSTRUCTION  
 OR RECORDING  
 DWG NO 2C2-03  
**A59 OF A184**

ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)
TRACS NO.	H6876 OIL		

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

1240

1250

1260

1270

1280

1290

DESIGN	SR	DATE	08/07
DRAWN	MC	DATE	08/07
CHECKED	BB	DATE	08/07
ROUTE	SR 801		
LOCATION	SR 801 (SR 303L TO SR 202L)		
TRACS NO.	H6876 OIL		

ARIZONA DEPARTMENT OF TRANSPORTATION  
 INTERMODAL TRANSPORTATION DIVISION  
 ROADWAY DESIGN SERVICES  
 PROFILE SHEET  
 STA 1242+00 TO 1294+00  
 SUBSECTION 2C2

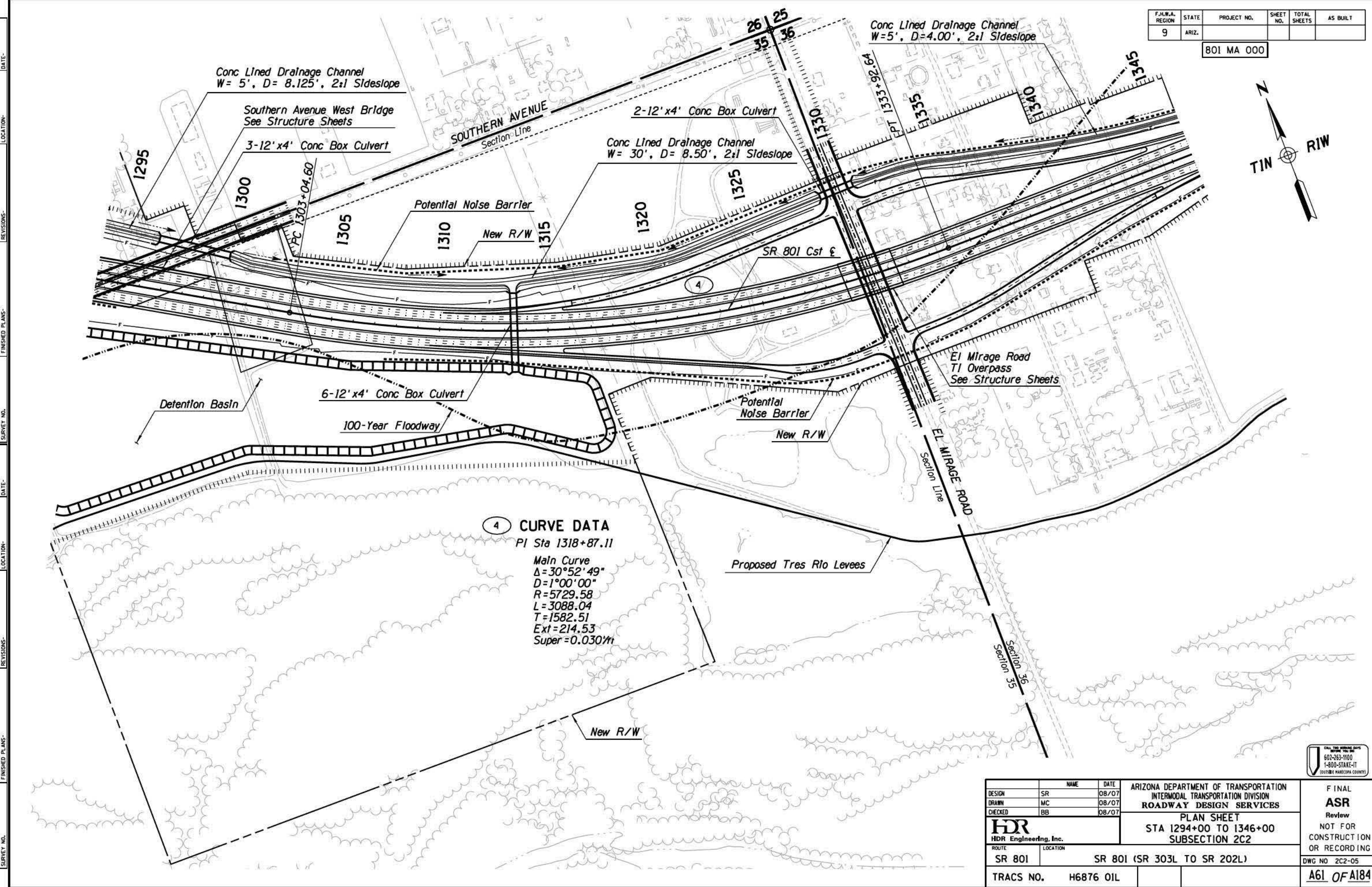
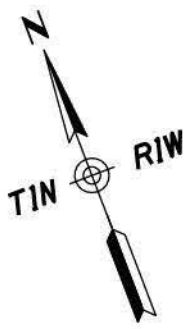
FINAL  
**ASR**  
 Review  
 NOT FOR  
 CONSTRUCTION  
 OR RECORDING  
 DWG NO 2C2-04  
**A60 OF A184**





F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



**④ CURVE DATA**  
 PI Sta 1318+87.11  
 Main Curve  
 $\Delta = 30^\circ 52' 49''$   
 $D = 1^\circ 00' 00''$   
 $R = 5729.58$   
 $L = 3088.04$   
 $T = 1582.51$   
 $Ext = 214.53$   
 $Super = 0.030\%/ft$

DESIGN	NAME	DATE
SR		08/07
MC		08/07
BB		08/07

ARIZONA DEPARTMENT OF TRANSPORTATION  
 INTERMODAL TRANSPORTATION DIVISION  
 ROADWAY DESIGN SERVICES  
 PLAN SHEET  
 STA 1294+00 TO 1346+00  
 SUBSECTION 2C2

FINAL  
**ASR**  
 Review  
 NOT FOR  
 CONSTRUCTION  
 OR RECORDING  
 DWG NO 2C2-05

SR 801

SR 801 (SR 303L TO SR 202L)

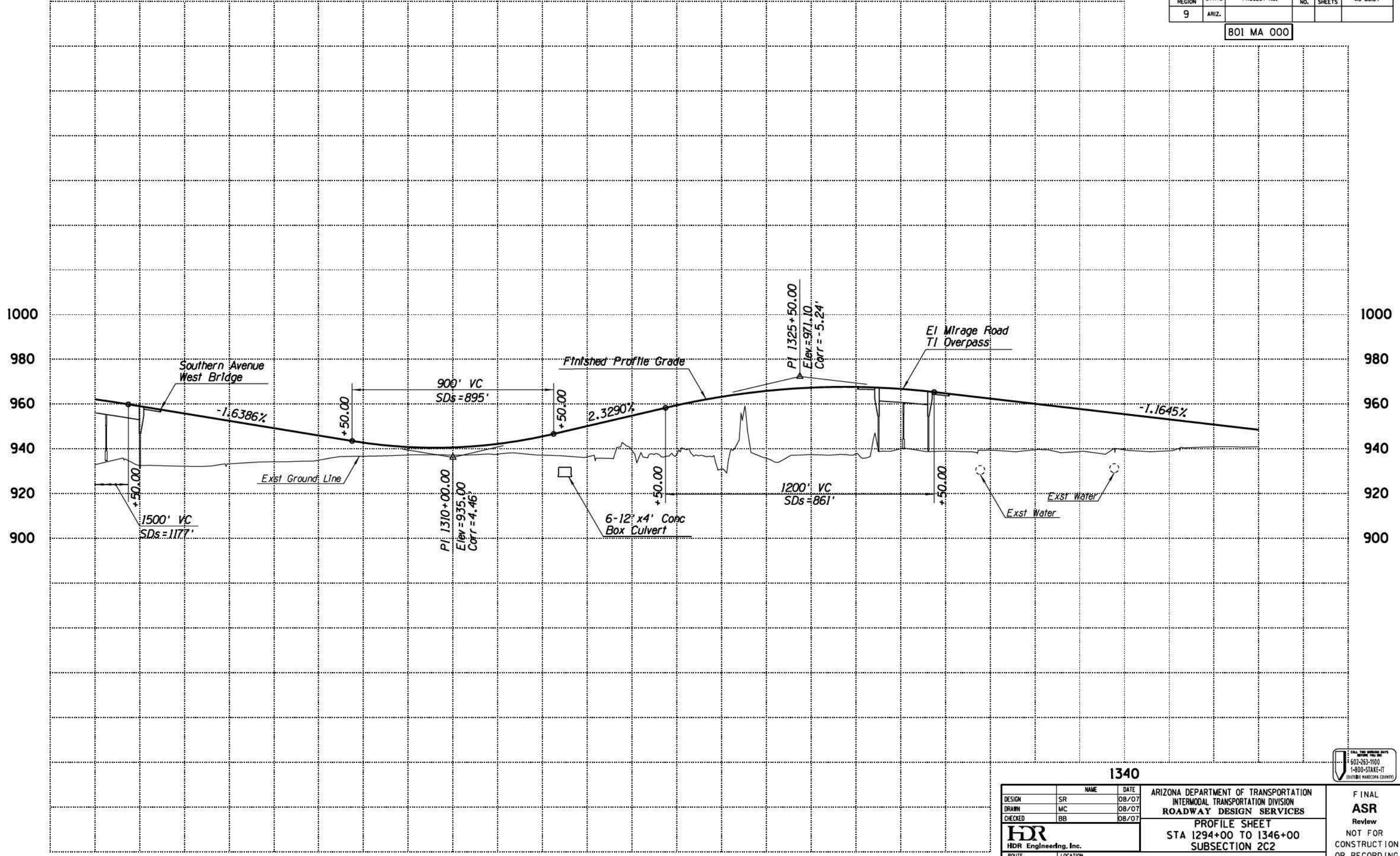
TRACS NO. H6876 OIL

**A61 OF A184**

DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



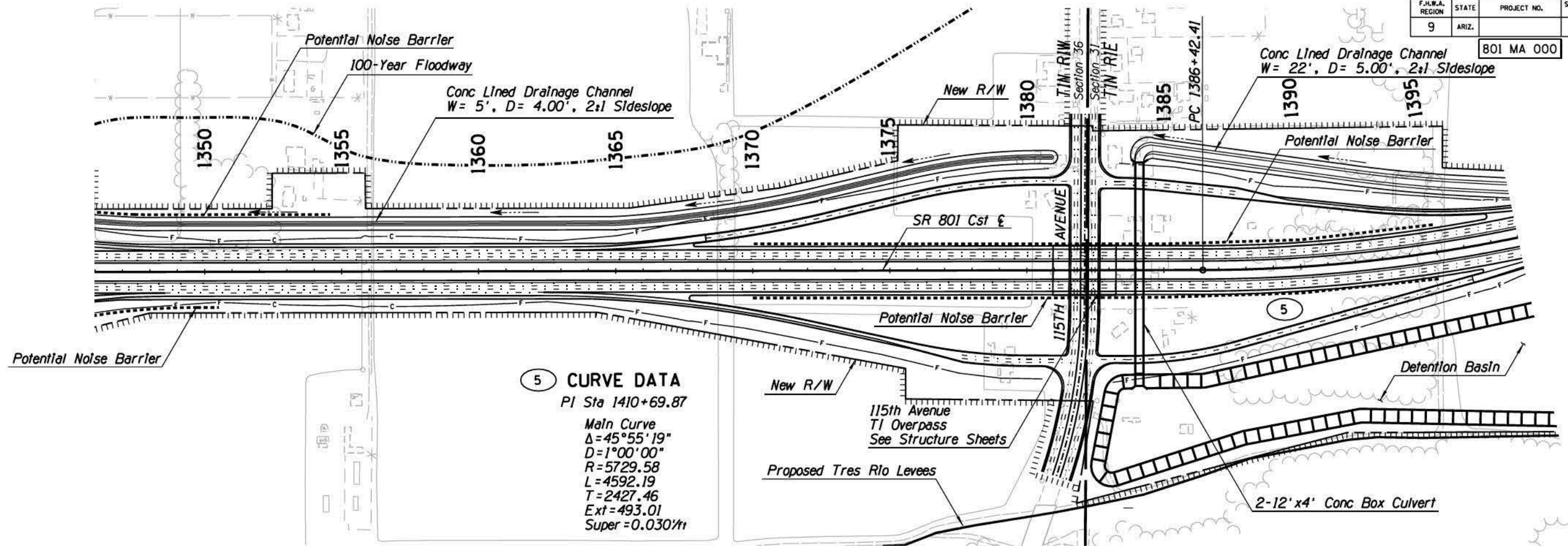
SURVEY NO. LOCATION DATE FINISHED PLANS REVISIONS FINISHED PLANS DATE SURVEY NO. LOCATION DATE FINISHED PLANS REVISIONS FINISHED PLANS DATE SURVEY NO.

1300 1310 1320 1330

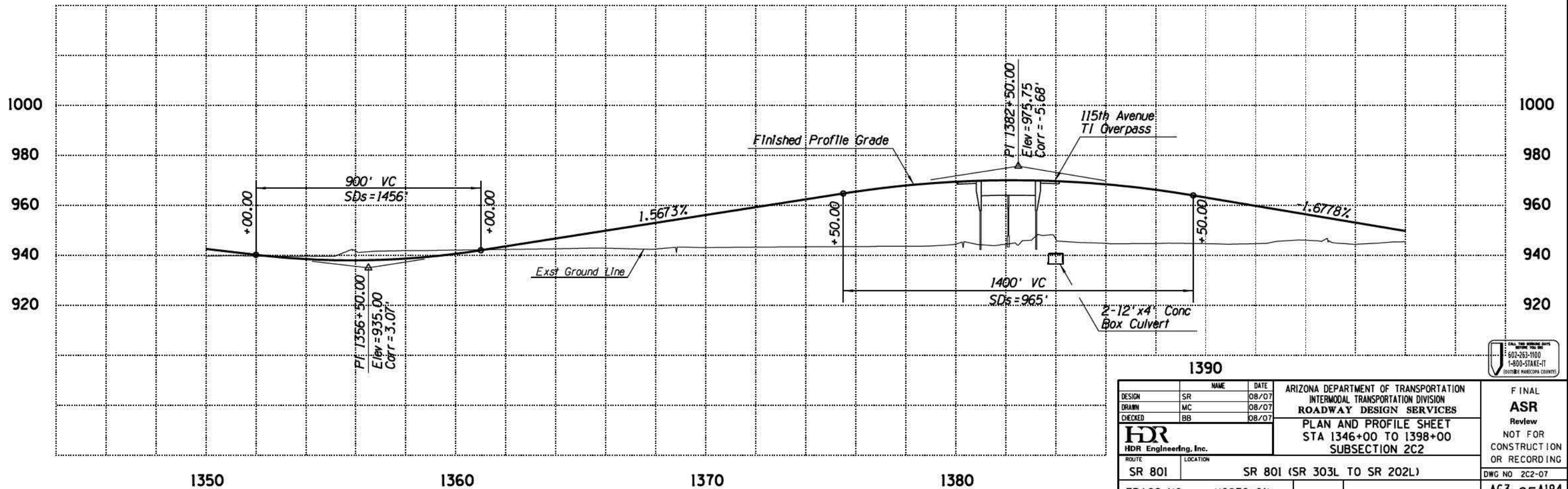
1340		ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES <b>PROFILE SHEET</b> STA 1294+00 TO 1346+00 SUBSECTION 2C2	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING DWG NO 2C2-06 <b>A62 OF A184</b>		
DESIGN	SR			DATE	08/07
DRAWN	MC			DATE	08/07
CHECKED	BB	DATE	08/07		
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)		
TRACS NO.	H6876 OIL				

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



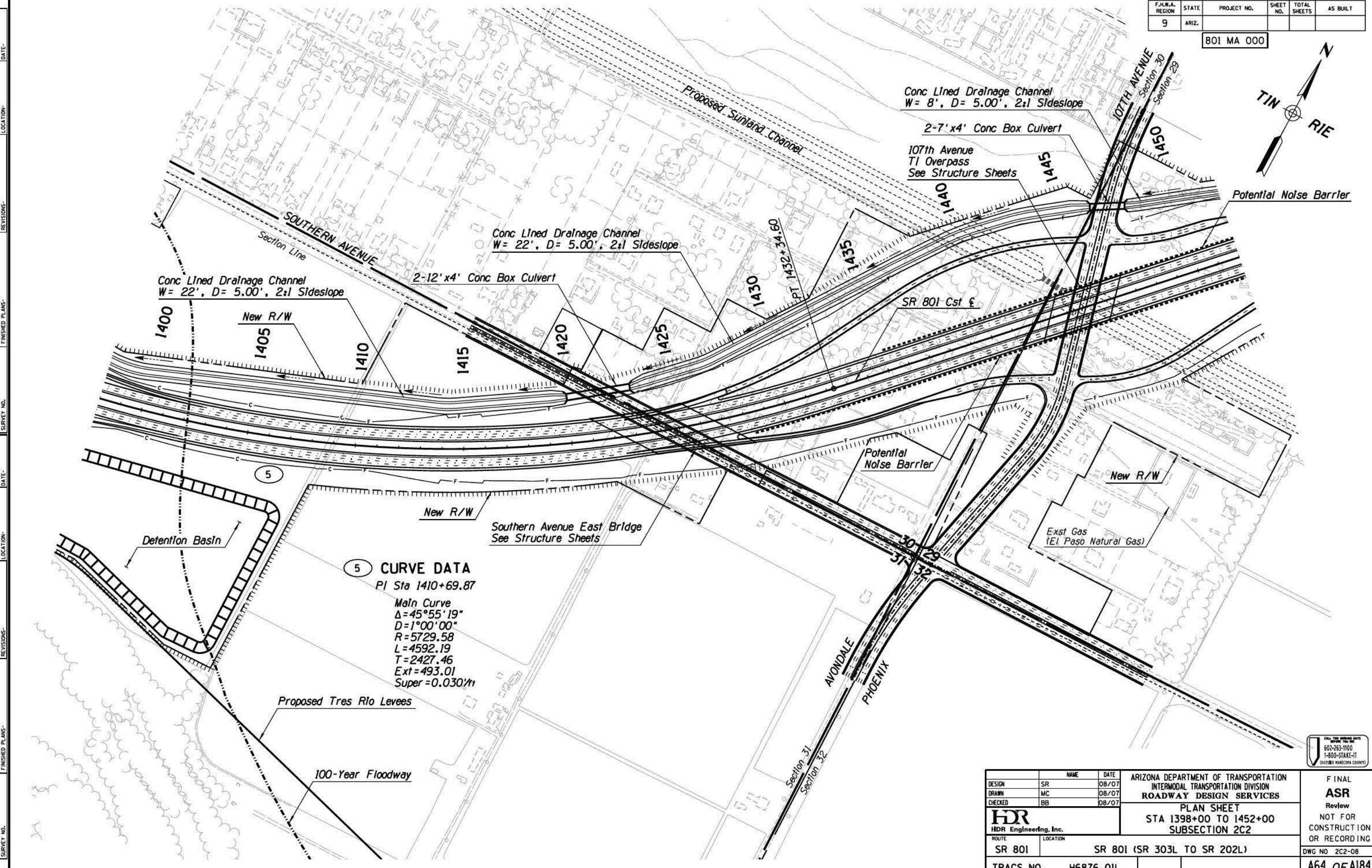
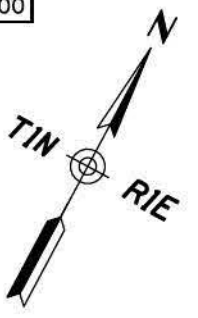
**5 CURVE DATA**  
 PI Sta 1410+69.87  
 Main Curve  
 $\Delta = 45^\circ 55' 19''$   
 $D = 1^\circ 00' 00''$   
 $R = 5729.58$   
 $L = 4592.19$   
 $T = 2427.46$   
 $Ext = 493.01$   
 $Super = 0.030'/ft$



DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		MC	08/07		
CHECKED		BB	08/07		
ROUTE		SR 801		PLAN AND PROFILE SHEET STA 1346+00 TO 1398+00 SUBSECTION 2C2	DWG NO 2C2-07
LOCATION		SR 801 (SR 303L TO SR 202L)			
TRACS NO.		H6876 OIL		A63 OF A184	

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



Conc Lined Drainage Channel  
W= 22', D= 5.00', 2:1 Sideslope

Conc Lined Drainage Channel  
W= 22', D= 5.00', 2:1 Sideslope

Conc Lined Drainage Channel  
W= 8', D= 5.00', 2:1 Sideslope

2-7'x4' Conc Box Culvert

107th Avenue  
TI Overpass  
See Structure Sheets

2-12'x4' Conc Box Culvert

SR 801 Cst E

**5 CURVE DATA**  
PI Sta 1410+69.87  
Main Curve  
Δ=45°55'19"  
D=1°00'00"  
R=5729.58  
L=4592.19  
T=2427.46  
Ext=493.01  
Super=0.030/ft

Detention Basin

Southern Avenue East Bridge  
See Structure Sheets

Potential Noise Barrier

New R/W

Exst Gas  
(El Paso Natural Gas)

Proposed Tres Rio Levees

100-Year Floodway



DESIGN	NAME	DATE
SR		08/07
MC		08/07
BB		08/07

ARIZONA DEPARTMENT OF TRANSPORTATION  
INTERMODAL TRANSPORTATION DIVISION  
ROADWAY DESIGN SERVICES

FINAL  
**ASR**  
Review  
NOT FOR  
CONSTRUCTION  
OR RECORDING



PLAN SHEET  
STA 1398+00 TO 1452+00  
SUBSECTION 2C2

DWG NO 2C2-08

ROUTE SR 801

LOCATION SR 801 (SR 303L TO SR 202L)

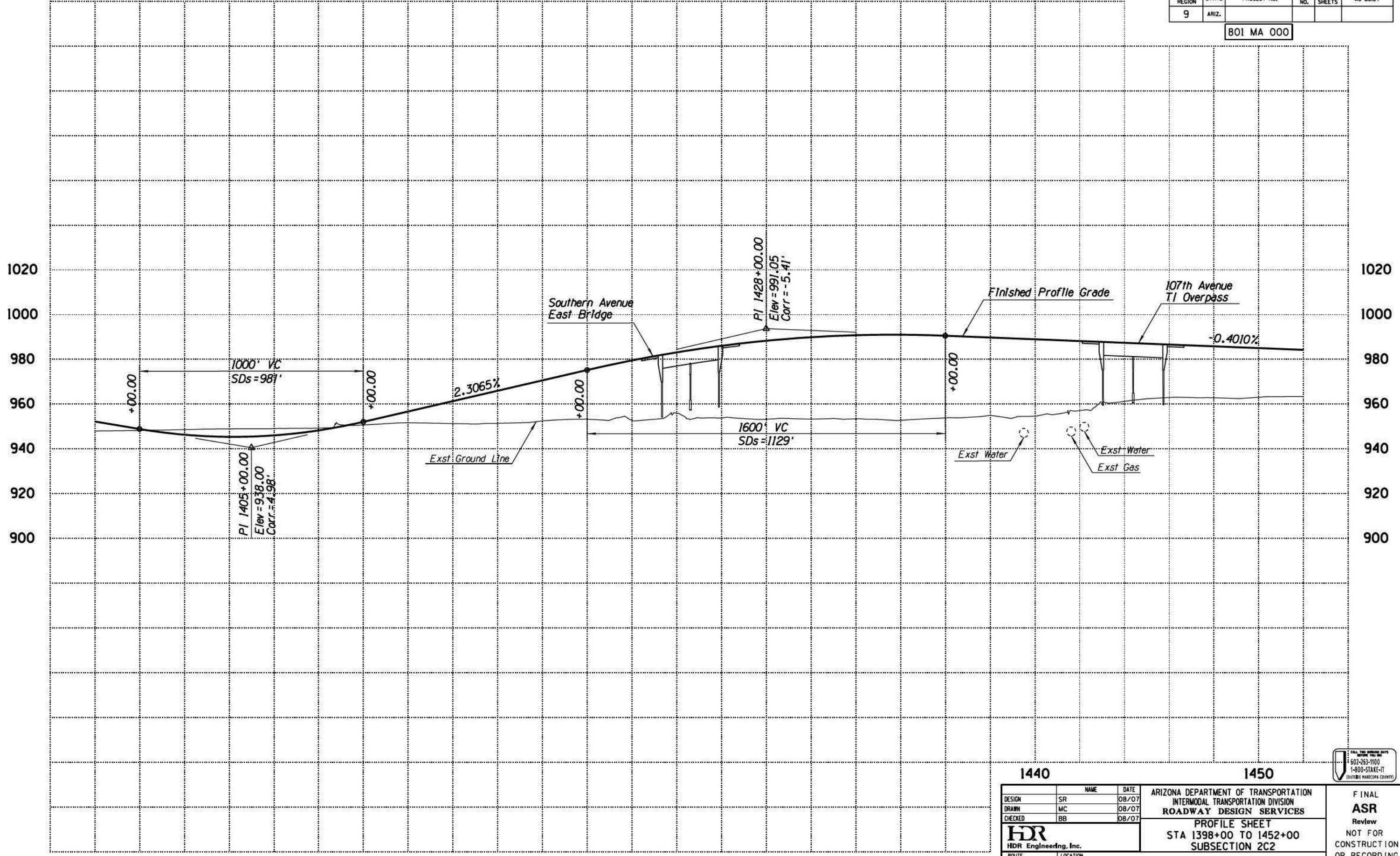
TRACS NO. H6876 OIL

A64 OF A184

DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



SURVEY NO. FINISHED PLANS- REVISIONS- LOCATION- DATE- FINISHED PLANS- SURVEY NO. DATE- REVISIONS- LOCATION- DATE-

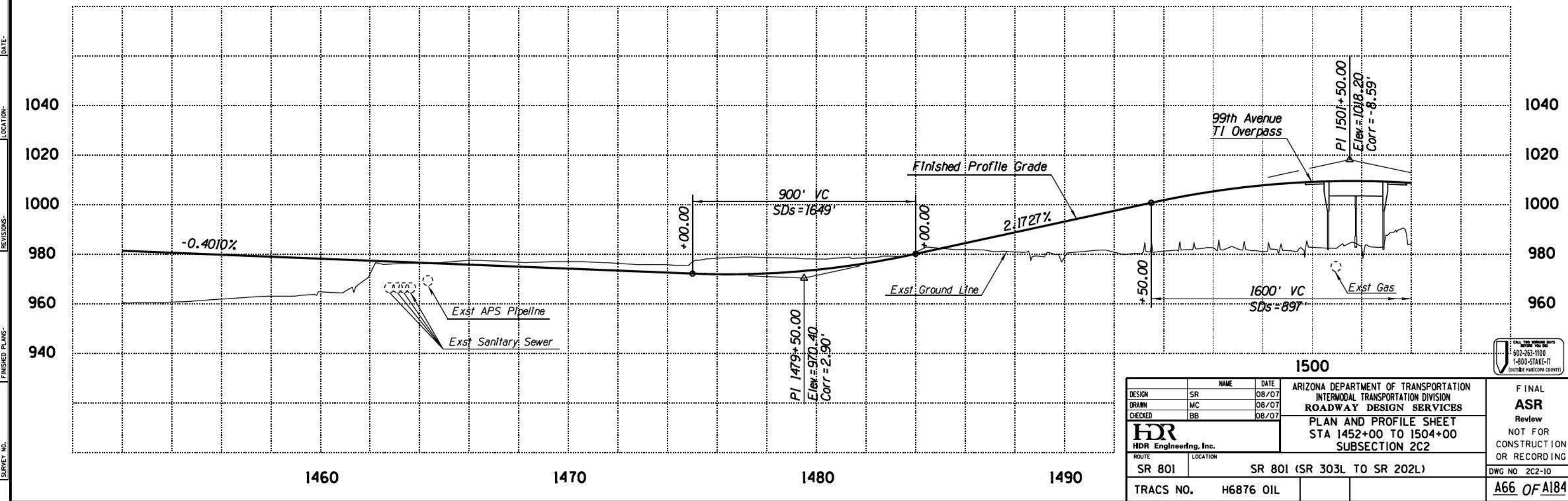
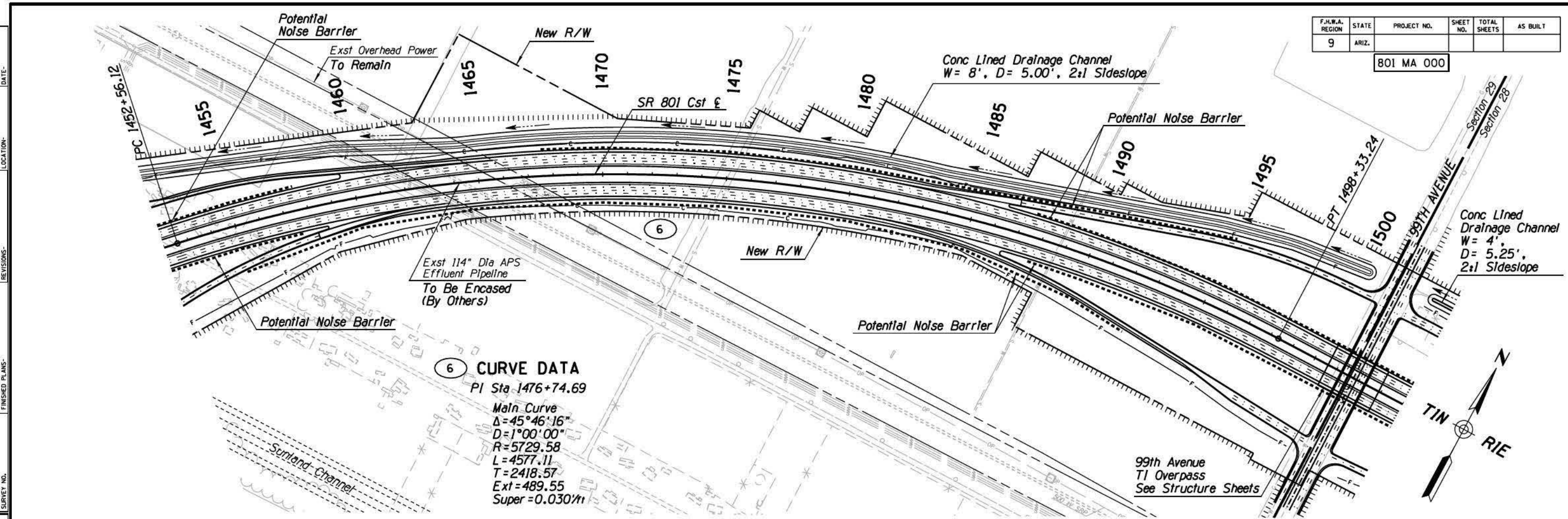
1400 1410 1420 1430

1440		1450	
DESIGN	SR	DATE	08/07
DRAWN	MC	DATE	08/07
CHECKED	BB	DATE	08/07
		ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	
ROUTE SR 801		LOCATION SR 801 (SR 303L TO SR 202L)	
TRACS NO. H6876 OIL		PROFILE SHEET STA 1398+00 TO 1452+00 SUBSECTION 2C2	
		FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING	
		DWG NO 2C2-09 <b>A65 OF A184</b>	



F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

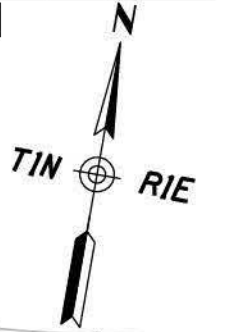
801 MA 000



DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	MC	DATE	08/07		
CHECKED	BB	DATE	08/07		
SR 801		SR 801 (SR 303L TO SR 202L)		PLAN AND PROFILE SHEET STA 1452+00 TO 1504+00 SUBSECTION 2C2	
TRACS NO.		H6876 OIL		DWG NO 2C2-10	
				A66 OF A184	

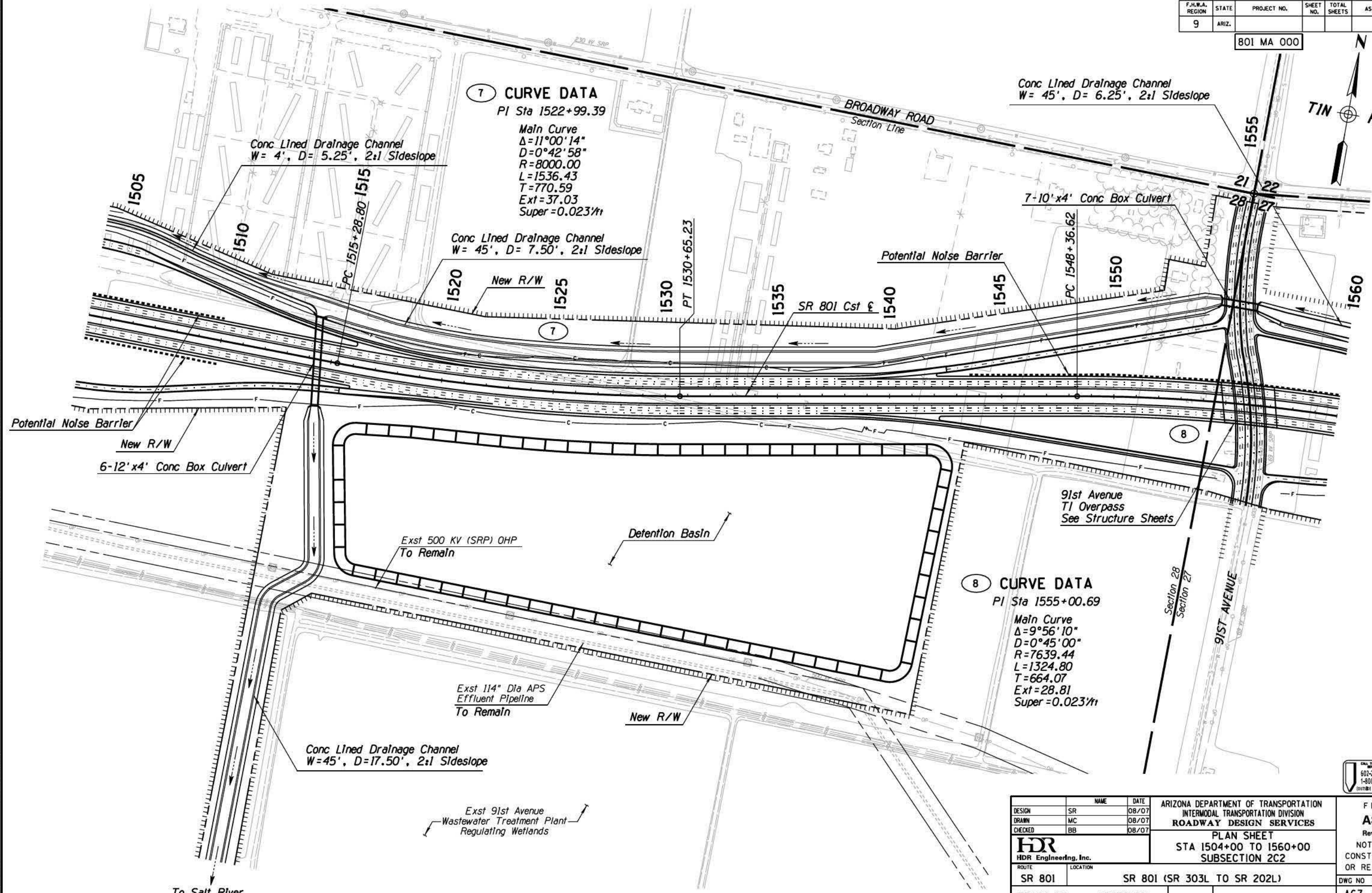
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



**7 CURVE DATA**  
 PI Sta 1522+99.39  
 Main Curve  
 $\Delta = 11^{\circ}00'14''$   
 $D = 0^{\circ}42'58''$   
 $R = 8000.00$   
 $L = 1536.43$   
 $T = 770.59$   
 $Ext = 37.03$   
 $Super = 0.0237ft$

**8 CURVE DATA**  
 PI Sta 1555+00.69  
 Main Curve  
 $\Delta = 9^{\circ}56'10''$   
 $D = 0^{\circ}45'00''$   
 $R = 7639.44$   
 $L = 1324.80$   
 $T = 664.07$   
 $Ext = 28.81$   
 $Super = 0.0237ft$



DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

Conc Lined Drainage Channel  
 $W = 45', D = 6.25', 2:1$  Sideslope

Conc Lined Drainage Channel  
 $W = 4', D = 5.25', 2:1$  Sideslope

Conc Lined Drainage Channel  
 $W = 45', D = 7.50', 2:1$  Sideslope

7-10'x4' Conc Box Culvert

6-12'x4' Conc Box Culvert

91st Avenue  
 T1 Overpass  
 See Structure Sheets

Exst 500 KV (SRP) OHP  
 To Remain

Exst 114" Dia APS  
 Effluent Pipeline  
 To Remain

Conc Lined Drainage Channel  
 $W = 45', D = 17.50', 2:1$  Sideslope

Exst 91st Avenue  
 Wastewater Treatment Plant  
 Regulating Wetlands

To Salt River

DESIGN	NAME	DATE
SR		08/07
MC		08/07
BB		08/07

ARIZONA DEPARTMENT OF TRANSPORTATION  
 INTERMODAL TRANSPORTATION DIVISION  
 ROADWAY DESIGN SERVICES

FINAL  
**ASR**  
 Review  
 NOT FOR  
 CONSTRUCTION  
 OR RECORDING



PLAN SHEET  
 STA 1504+00 TO 1560+00  
 SUBSECTION 2C2

ROUTE: SR 801 LOCATION: SR 801 (SR 303L TO SR 202L)

DWG NO 2C2-II

TRACS NO. H6876 OIL

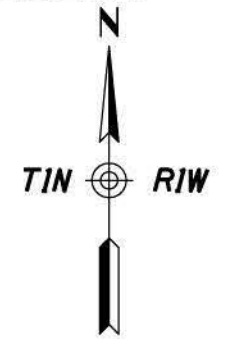
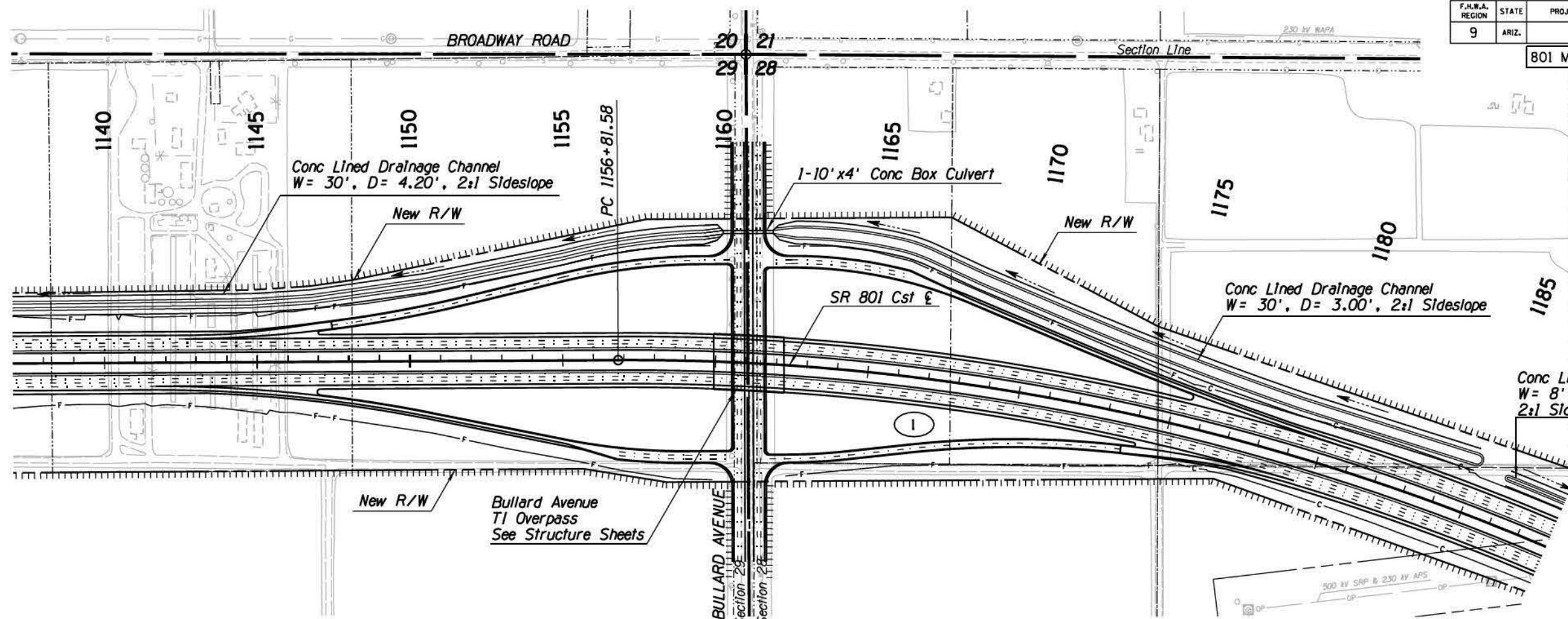
A67 OF A184





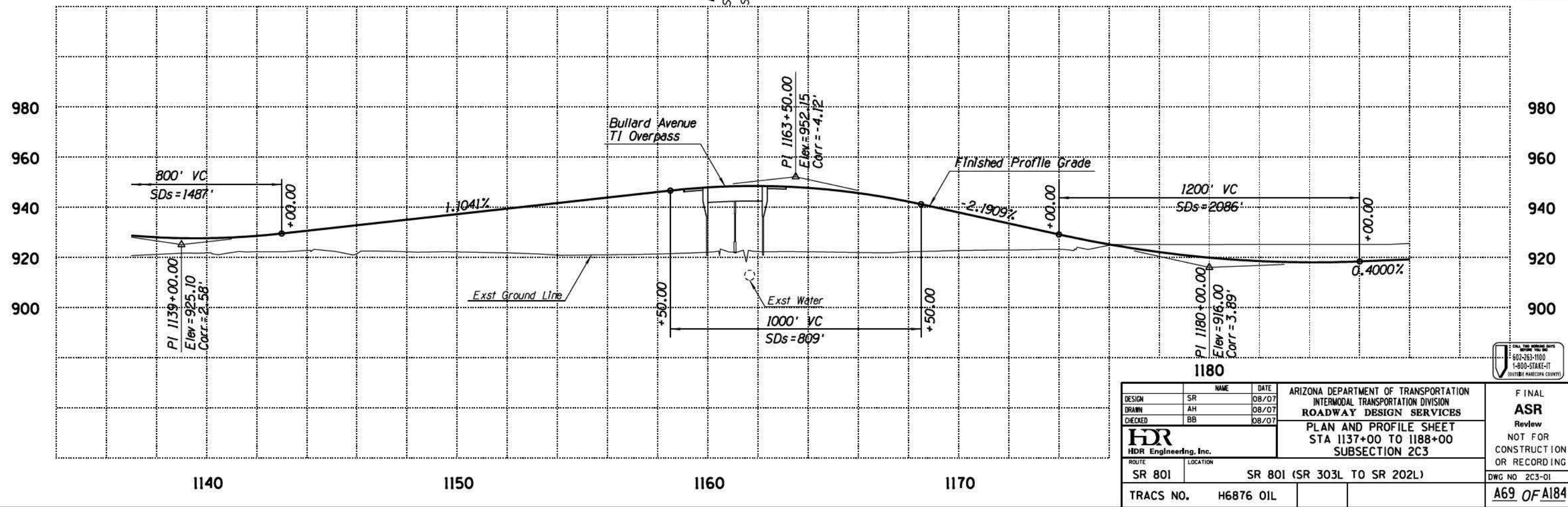
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



Conc Lined Drainage Channel  
W= 8', D= 4.65',  
2:1 Sideslope

**1 CURVE DATA**  
PI Sta 1193+05.57  
Main Curve  
 $\Delta = 50^\circ 45' 27''$   
 $D = 0^\circ 45' 00''$   
 $R = 7639.44$   
 $T = 3624.00$   
 $Ext = 816.00$   
 $Super = 0.023'/ft$



DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	AH	DATE	08/07		
CHECKED	BB	DATE	08/07		
<b>HDR</b> HDR Engineering, Inc.				PLAN AND PROFILE SHEET STA 1137+00 TO 1188+00 SUBSECTION 2C3	DWG NO 2C3-01
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)	TRACS NO. H6876 OIL	
					A69 OF A184

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

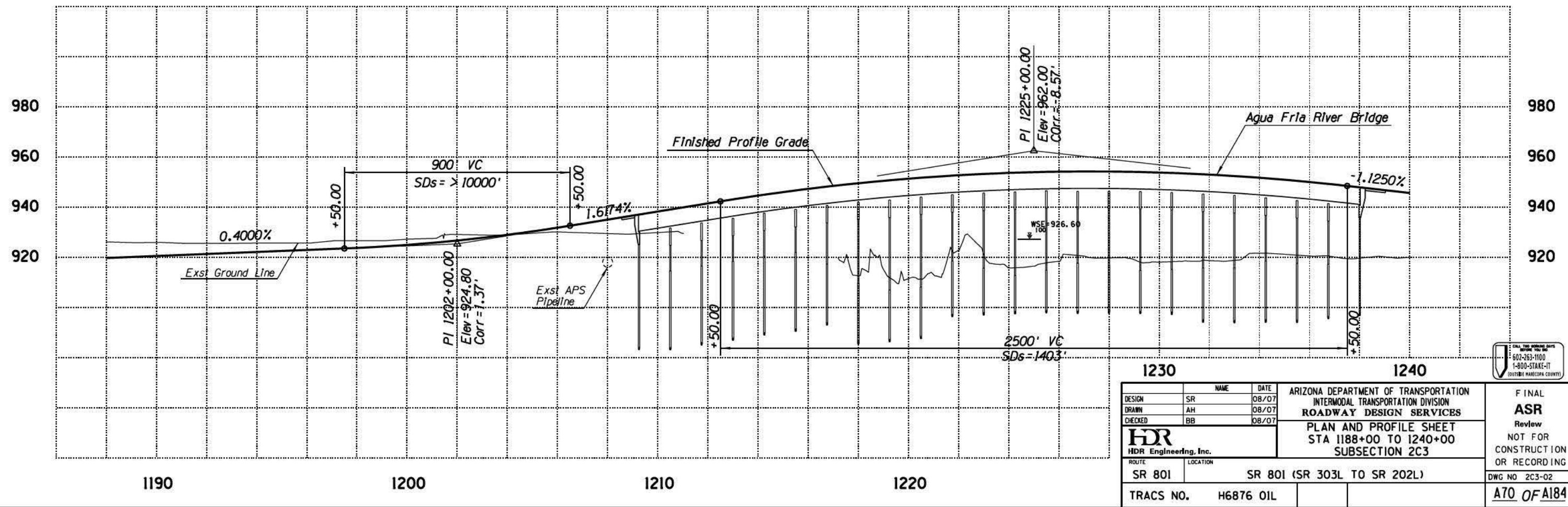
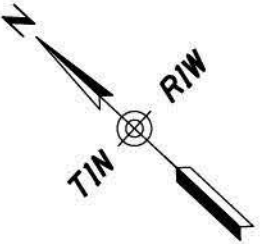
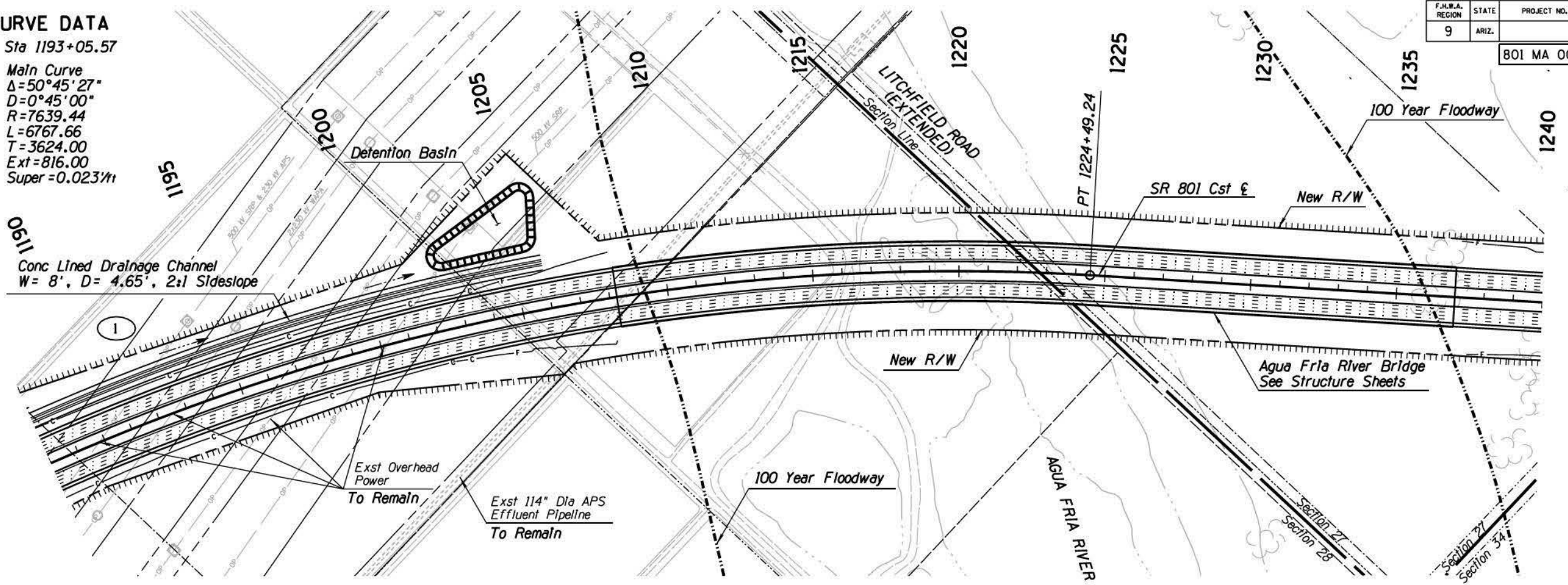
BOI MA 000

**1 CURVE DATA**

PI Sta 1193+05.57

Main Curve  
 $\Delta = 50^\circ 45' 27''$   
 $D = 0^\circ 45' 00''$   
 $R = 7639.44$   
 $L = 6767.66$   
 $T = 3624.00$   
 $Ext = 816.00$   
 $Super = 0.023'/ft$

Conc Lined Drainage Channel  
 $W = 8'$ ,  $D = 4.65'$ , 2:1 Sideslope

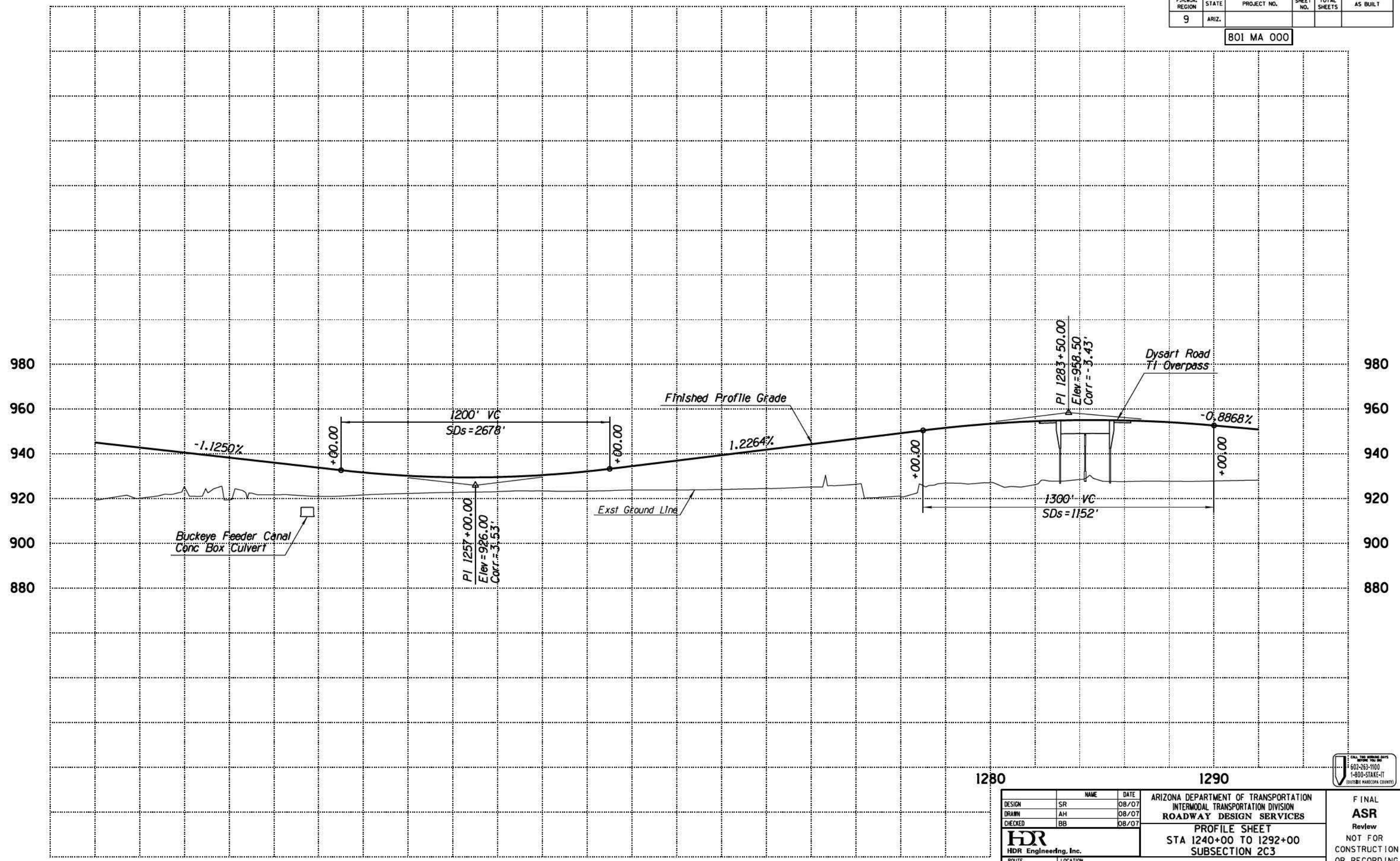


DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		AH	08/07		
CHECKED		BB	08/07		
ROUTE		SR 801 (SR 303L TO SR 202L)		PLAN AND PROFILE SHEET STA 1188+00 TO 1240+00 SUBSECTION 2C3	DWG NO 2C3-02
LOCATION		SR 801 (SR 303L TO SR 202L)		TRACS NO. H6876 OIL	A70 OF A184



F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



DATE: \_\_\_\_\_ LOCATION: \_\_\_\_\_ REVISIONS: \_\_\_\_\_ FINISHED PLANS: \_\_\_\_\_ SURVEY NO. \_\_\_\_\_ DATE: \_\_\_\_\_ LOCATION: \_\_\_\_\_ REVISIONS: \_\_\_\_\_ FINISHED PLANS: \_\_\_\_\_ SURVEY NO. \_\_\_\_\_

DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES <b>PROFILE SHEET</b> STA 1240+00 TO 1292+00 SUBSECTION 2C3	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING DWG NO 2C3-04
DRAWN		AH	08/07		
CHECKED		BB	08/07		
ROUTE		SR 801			TRACS NO. H6876 OIL
LOCATION		SR 801 (SR 303L TO SR 202L)			
					A72 OF A184



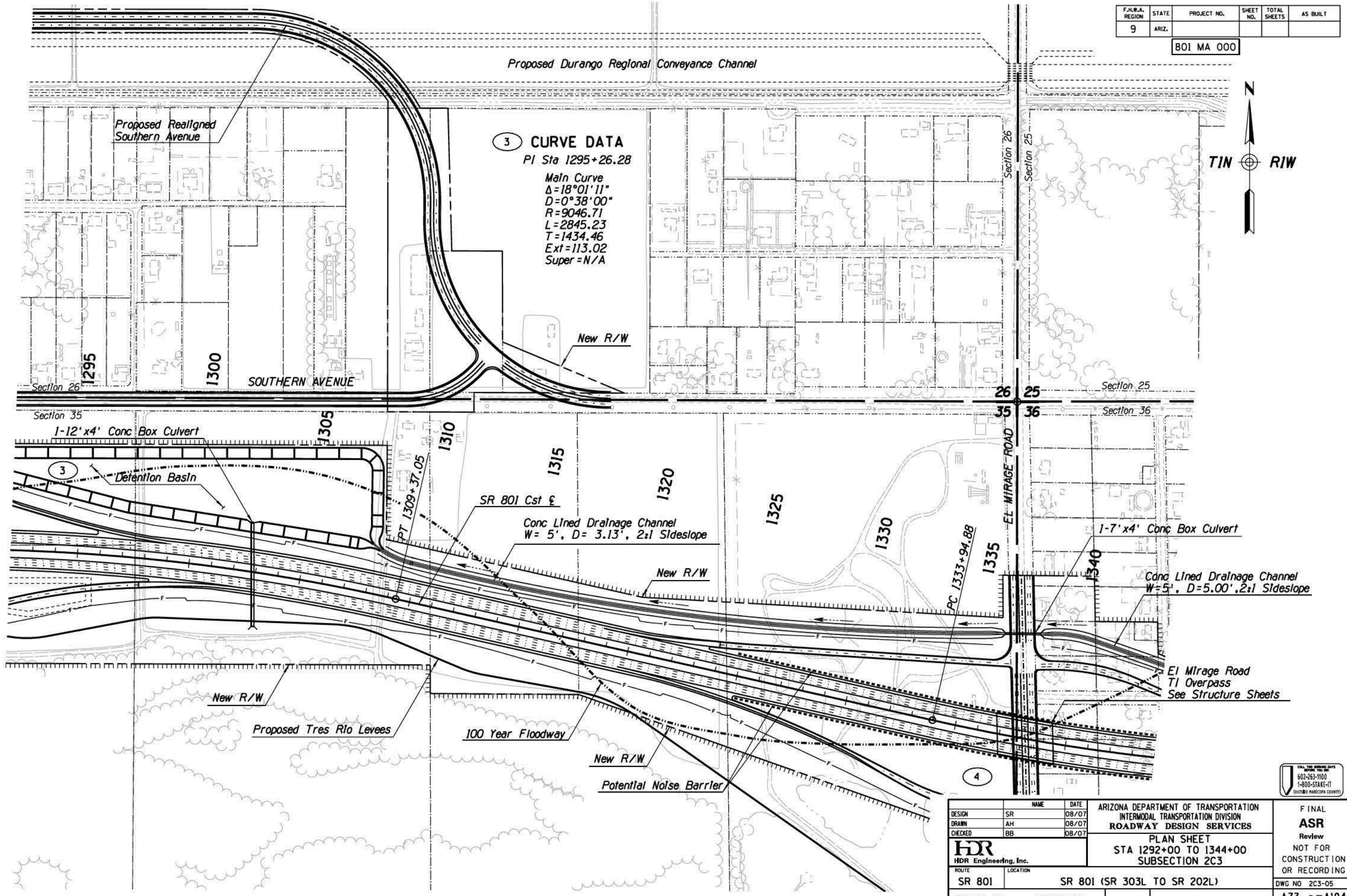
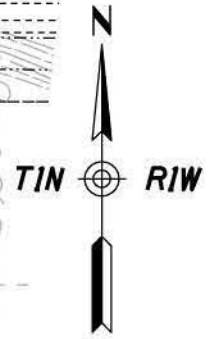
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000

Proposed Durango Regional Conveyance Channel

Proposed Realigned Southern Avenue

**3 CURVE DATA**  
 PI Sta 1295+26.28  
 Main Curve  
 $\Delta = 18^{\circ}01'11''$   
 $D = 0^{\circ}38'00''$   
 $R = 9046.71$   
 $L = 2845.23$   
 $T = 1434.46$   
 $Ext = 113.02$   
 $Super = N/A$



DATE: \_\_\_\_\_ LOCATION: \_\_\_\_\_ REVISIONS: \_\_\_\_\_ FINISHED PLANS: \_\_\_\_\_ SURVEY NO. \_\_\_\_\_ DATE: \_\_\_\_\_ LOCATION: \_\_\_\_\_ REVISIONS: \_\_\_\_\_ FINISHED PLANS: \_\_\_\_\_ SURVEY NO. \_\_\_\_\_

4



DESIGN	NAME	DATE
SR		08/07
AH		08/07
BB		08/07

ARIZONA DEPARTMENT OF TRANSPORTATION  
 INTERMODAL TRANSPORTATION DIVISION  
 ROADWAY DESIGN SERVICES

FINAL  
**ASR**  
 Review  
 NOT FOR  
 CONSTRUCTION  
 OR RECORDING  
 DWG NO 2C3-05



PLAN SHEET  
 STA 1292+00 TO 1344+00  
 SUBSECTION 2C3

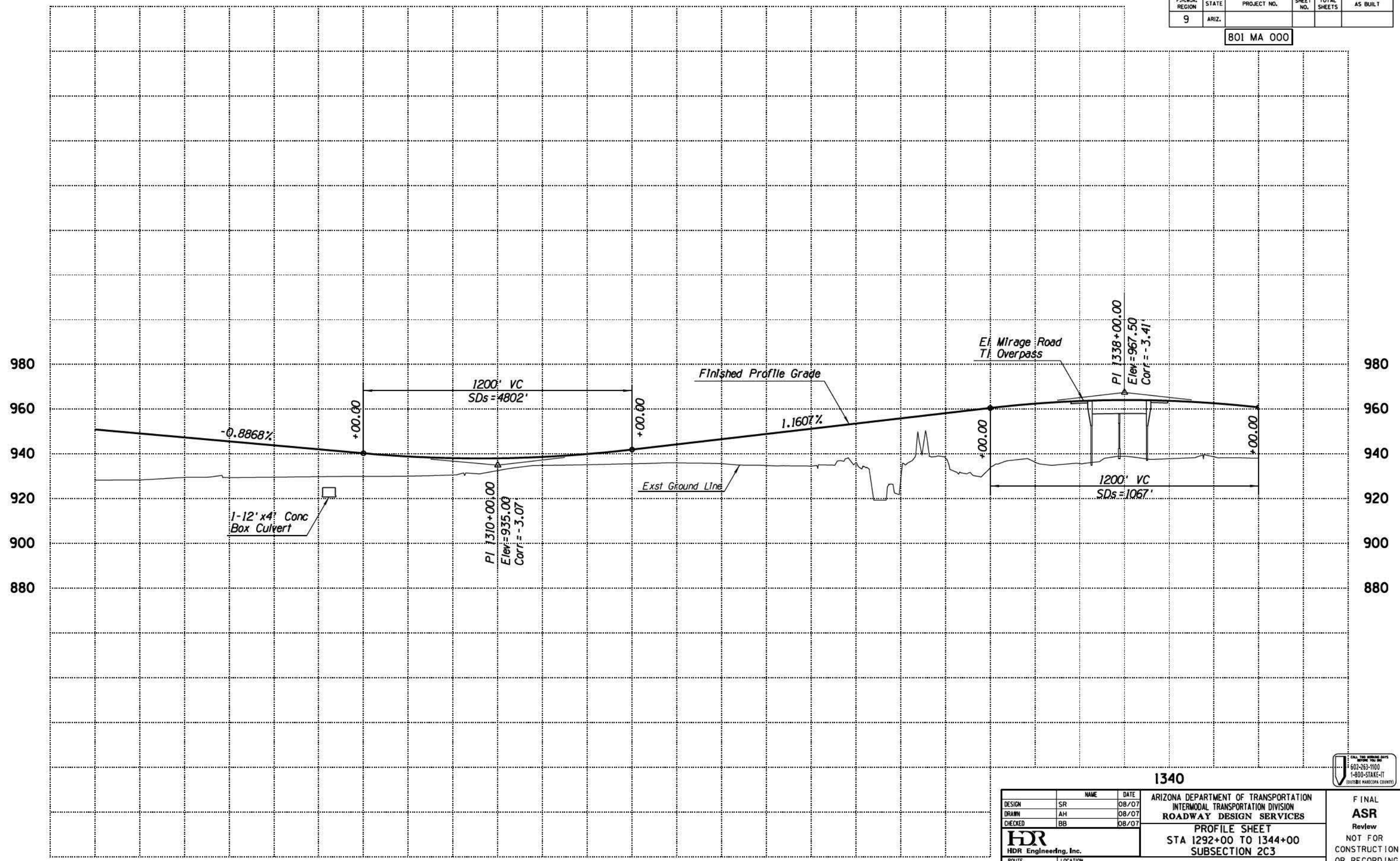
ROUTE: SR 801 LOCATION: SR 801 (SR 303L TO SR 202L)

TRACS NO. H6876 OIL

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F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



DATE: \_\_\_\_\_ LOCATION: \_\_\_\_\_ REVISIONS: \_\_\_\_\_ FINISHED PLANS: \_\_\_\_\_ SURVEY NO. \_\_\_\_\_ DATE: \_\_\_\_\_ LOCATION: \_\_\_\_\_ REVISIONS: \_\_\_\_\_ FINISHED PLANS: \_\_\_\_\_ SURVEY NO. \_\_\_\_\_

1300

1310

1320

1330

1340

DESIGN	SR	DATE	08/07
DRAWN	AH	DATE	08/07
CHECKED	BB	DATE	08/07
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)
TRACS NO.	H6876 OIL		

ARIZONA DEPARTMENT OF TRANSPORTATION  
 INTERMODAL TRANSPORTATION DIVISION  
 ROADWAY DESIGN SERVICES  
 PROFILE SHEET  
 STA 1292+00 TO 1344+00  
 SUBSECTION 2C3

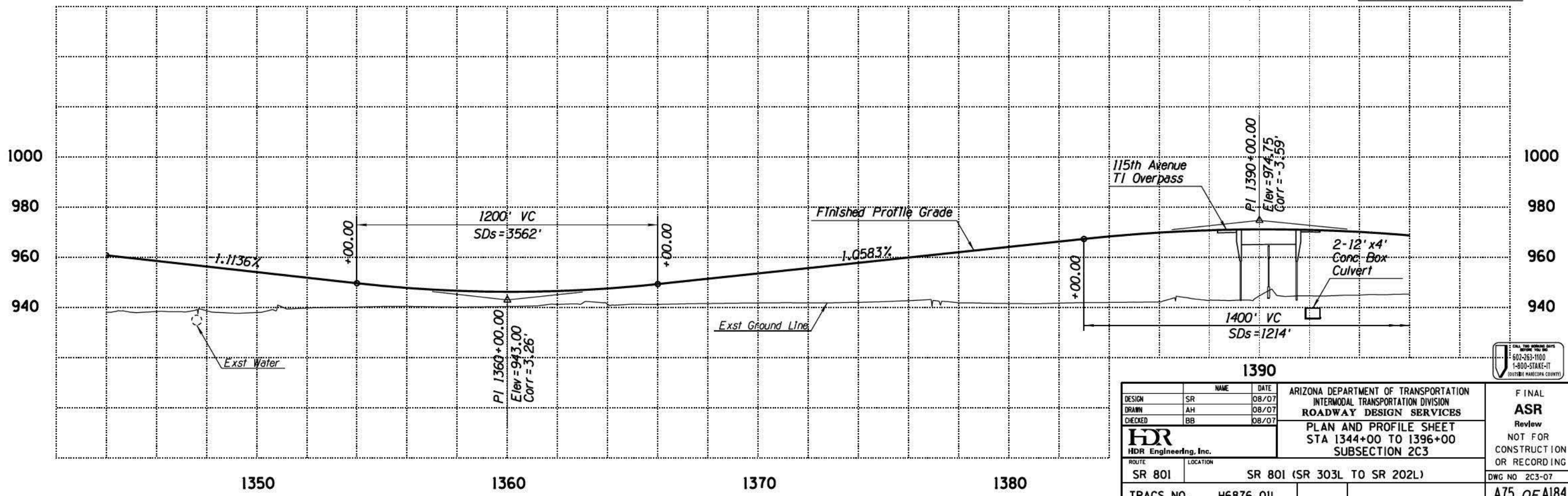
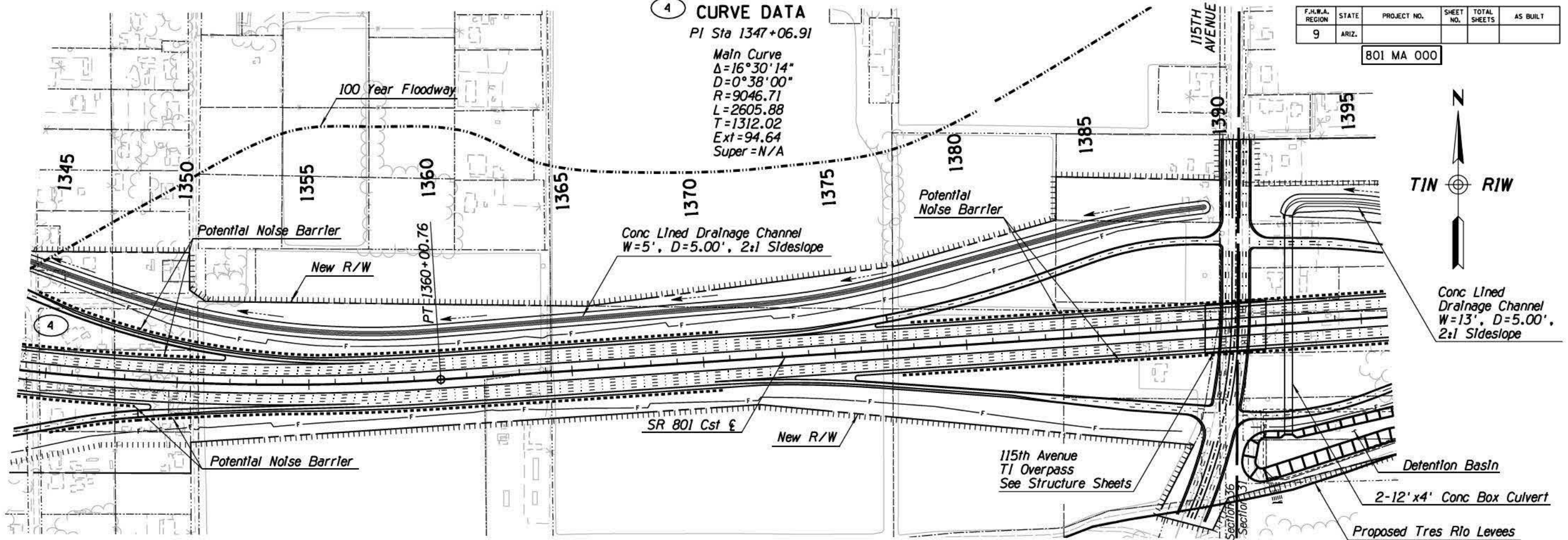


FINAL  
 ASR  
 Review  
 NOT FOR  
 CONSTRUCTION  
 OR RECORDING  
 DWG NO 2C3-06  
 A74 OF A184

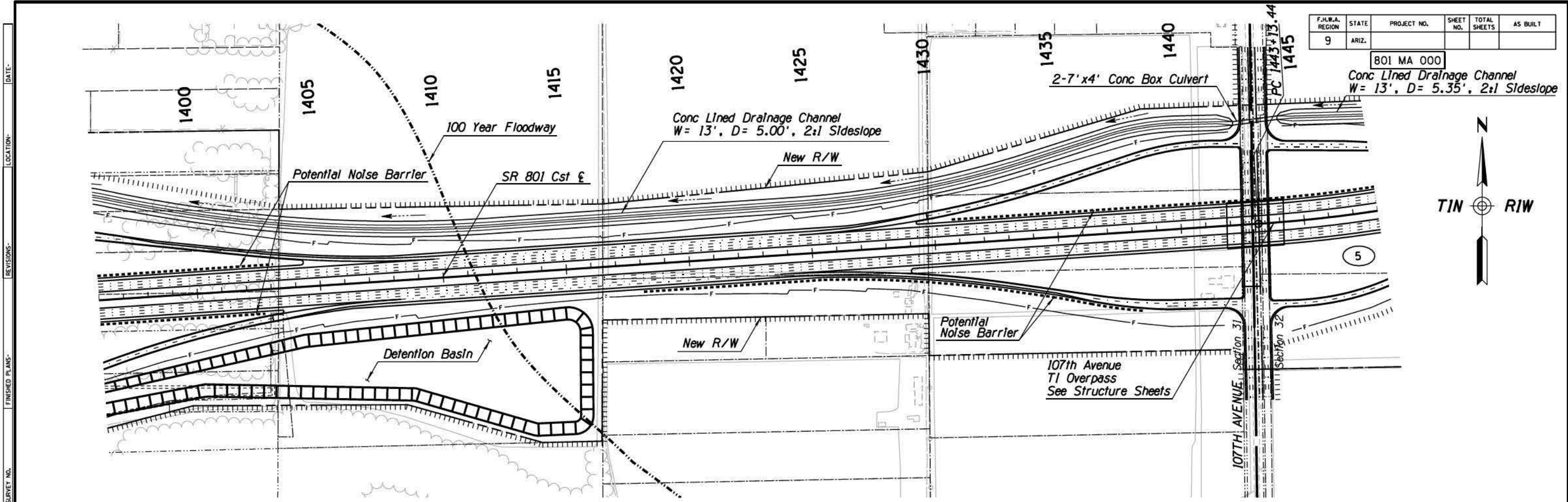
**4 CURVE DATA**  
 PI Sta 1347+06.91  
 Main Curve  
 $\Delta = 16^\circ 30' 14''$   
 $D = 0^\circ 38' 00''$   
 $R = 9046.71$   
 $L = 2605.88$   
 $T = 1312.02$   
 $Ext = 94.64$   
 $Super = N/A$

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000

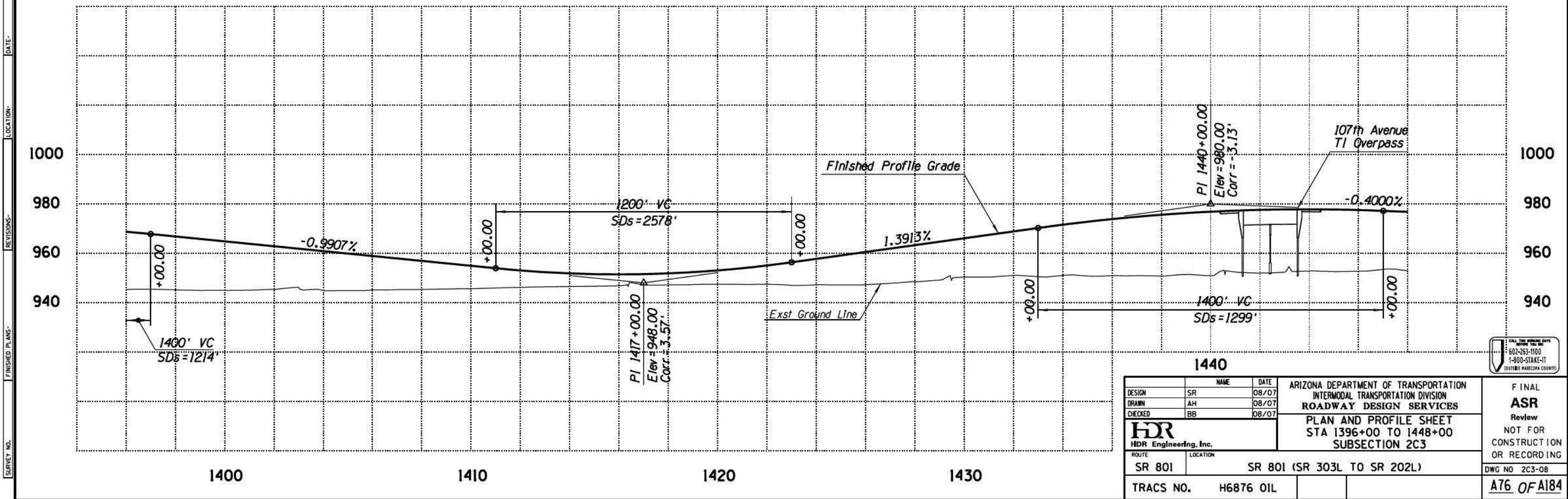


DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	AH	DATE	08/07		
CHECKED	BB	DATE	08/07		
<b>HDR</b> HDR Engineering, Inc.				PLAN AND PROFILE SHEET STA 1344+00 TO 1396+00 SUBSECTION 2C3	
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)	DWG NO 2C3-07	
TRACS NO.	H6876 OIL				A75 OF A184



F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000  
 Conc Lined Drainage Channel  
 W= 13', D= 5.35', 2:1 Sideslope



DESIGN		SR	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN		AH	08/07		
CHECKED		BB	08/07		
ROUTE		SR 801		PLAN AND PROFILE SHEET STA 1396+00 TO 1448+00 SUBSECTION 2C3	
LOCATION		SR 801 (SR 303L TO SR 202L)		DWG NO 2C3-08	
TRACS NO.		H6876 OIL		A76 OF A184	



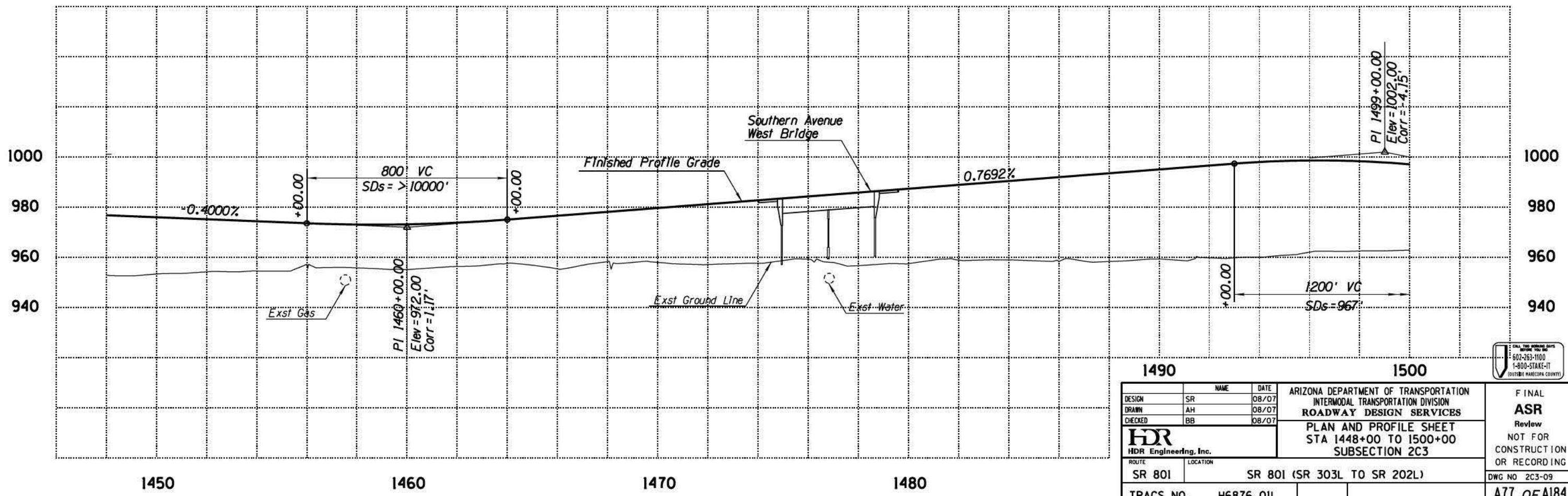
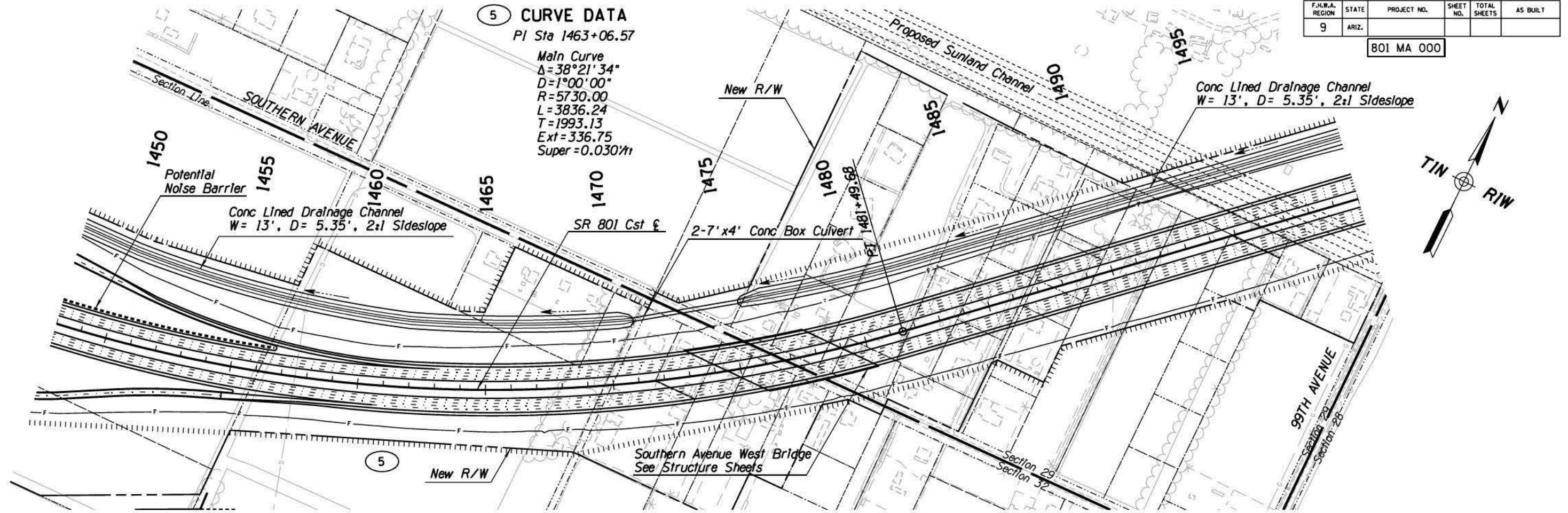
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000

**5 CURVE DATA**

PI Sta 1463+06.57

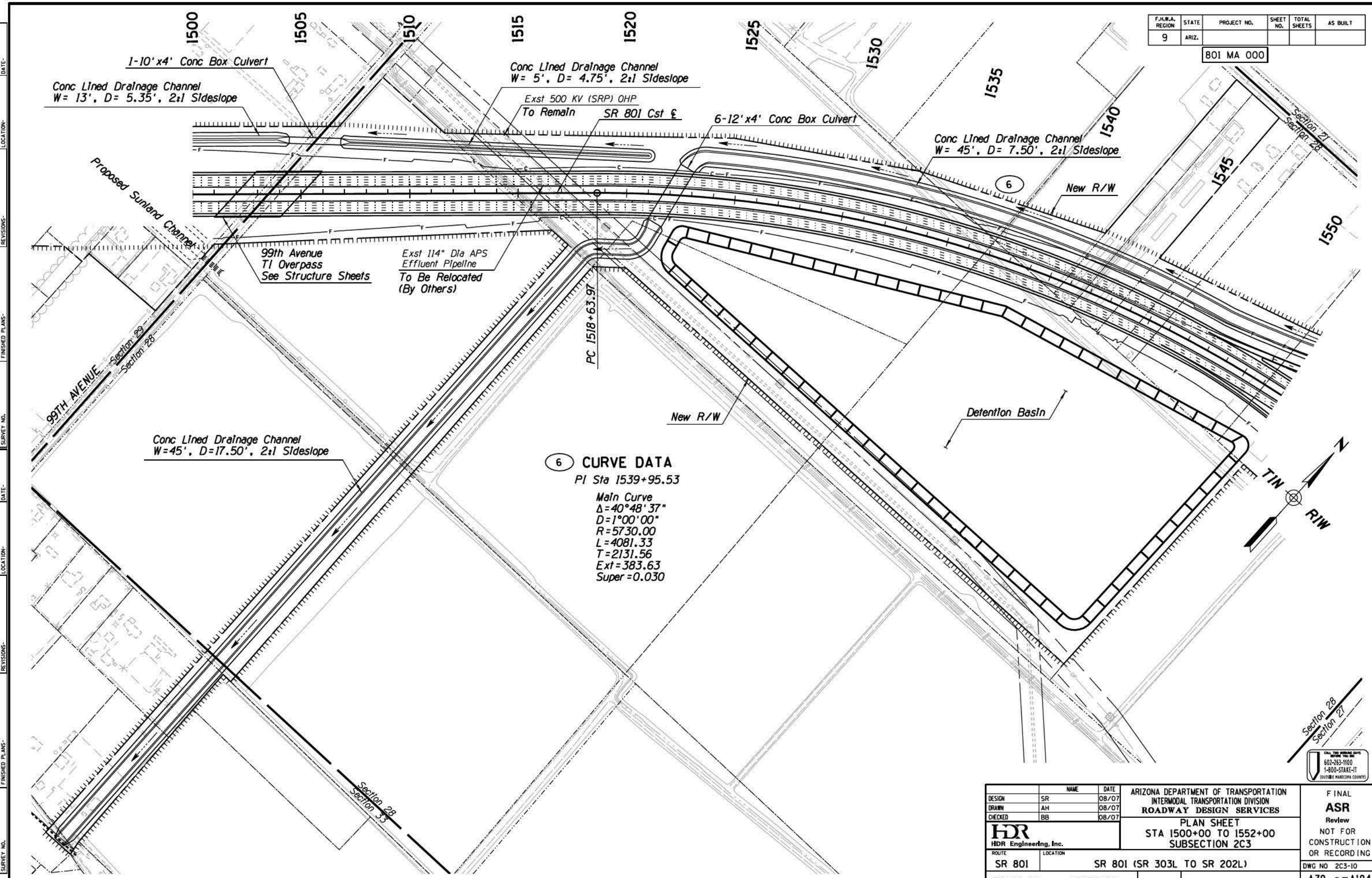
Main Curve  
 $\Delta = 38^{\circ}21'34''$   
 $D = 1^{\circ}00'00''$   
 $R = 5730.00$   
 $L = 3836.24$   
 $T = 1993.13$   
 $Ext = 336.75$   
 $Super = 0.030'/ft$



DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	AH	DATE	08/07		
CHECKED	BB	DATE	08/07		
<b>HDR</b> HDR Engineering, Inc.				PLAN AND PROFILE SHEET STA 1448+00 TO 1500+00 SUBSECTION 2C3	
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)	DWG NO 2C3-09	
TRACS NO.	H6876 OIL				<b>A77 OF A184</b>

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

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**6 CURVE DATA**  
 PI Sta 1539+95.53  
 Main Curve  
 $\Delta = 40^{\circ}48'37''$   
 $D = 1^{\circ}00'00''$   
 $R = 5730.00$   
 $L = 4081.33$   
 $T = 2131.56$   
 $Ext = 383.63$   
 $Super = 0.030$

DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO. DATE- LOCATION- REVISIONS- FINISHED PLANS- SURVEY NO.

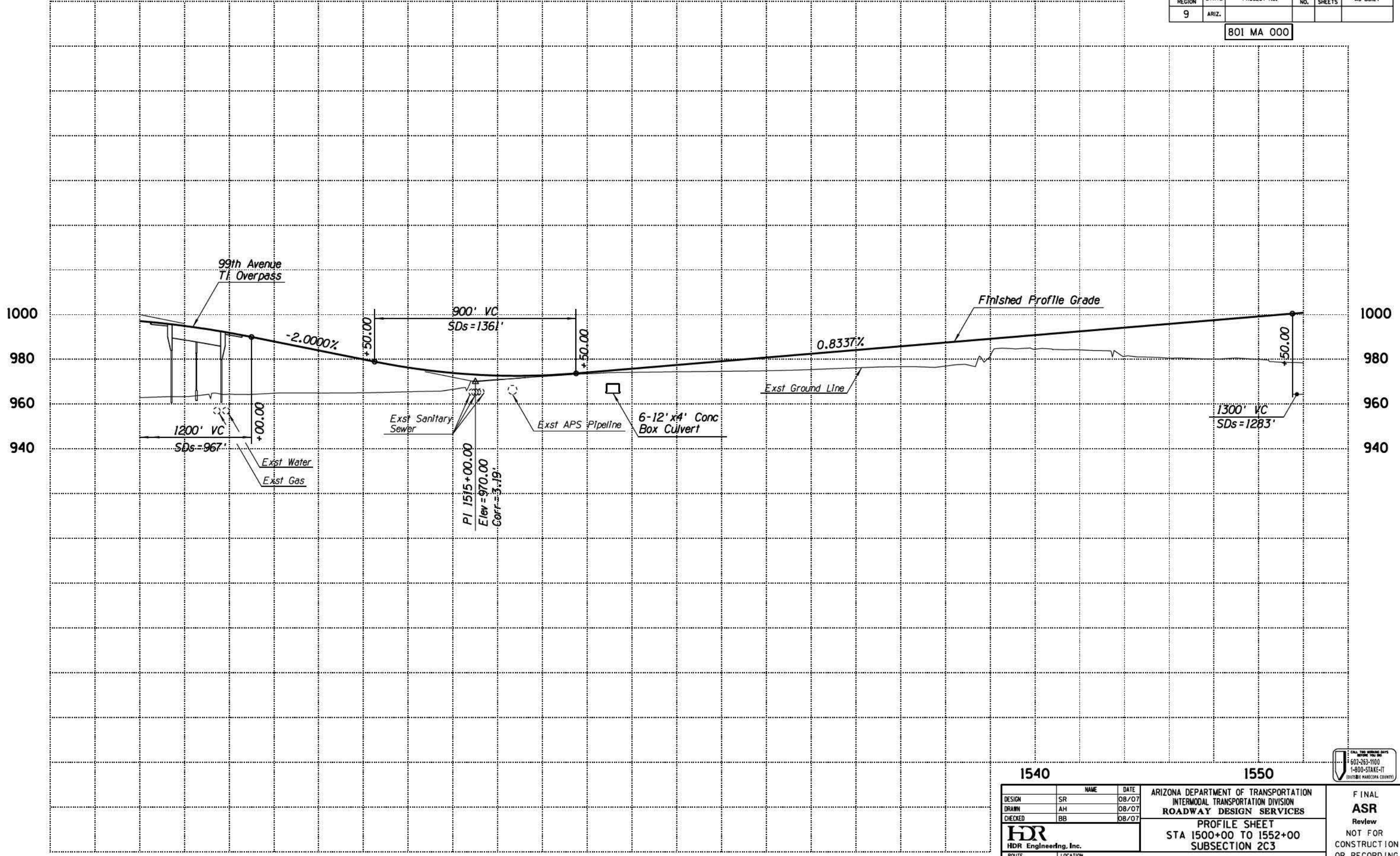
Section 28  
 Section 27

CALL FOR PUBLIC HEARINGS  
 602-263-1100  
 1-800-STAKE-IT  
 (OUTSIDE MARICOPA COUNTY)

DESIGN	SR	DATE	08/07	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	FINAL <b>ASR</b> Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	AH	DATE	08/07		
CHECKED	BB	DATE	08/07		
<b>HDR</b> HDR Engineering, Inc.				PLAN SHEET STA 1500+00 TO 1552+00 SUBSECTION 2C3	
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)	DWG NO 2C3-10	
TRACS NO.	H6876 OIL				<b>A78 OF A184</b>

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.				

801 MA 000



SURVEY NO. FINISHED PLANS- REVISIONS- LOCATION- DATE- FINISHED PLANS- SURVEY NO. DATE- FINISHED PLANS- REVISIONS- LOCATION- DATE-

1540		1550			<b>FINAL ASR Review</b> NOT FOR CONSTRUCTION OR RECORDING DWG NO 2C3-II <b>A79 OF A184</b>
DESIGN	SR	DATE	08/07		
DRAWN	AH	DATE	08/07		
CHECKED	BB	DATE	08/07		
		ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES <b>PROFILE SHEET</b> STA 1500+00 TO 1552+00 SUBSECTION 2C3			
ROUTE	SR 801	LOCATION	SR 801 (SR 303L TO SR 202L)		
TRACS NO.	H6876 OIL				